PREVALENCE OF DEPRESSION AND ASSOCIATED RISK FACTORS AMONG THE ELDERLY

A Dissertation submitted to

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY,

CHENNAI- 600 032

In partial fulfilment of the award of the degree of

MASTER OF PHARMACY

IN

Branch-VII –PHARMACY PRACTICE

Submitted by

Name: MUHAMMED SHAHEER .K

REG.No.261640205

Under the Guidance of

Dr. N. VENKATESWARAMURTHY, M.Pharm., PhD,

DEPARTMENT OF PHARMACY PRACTICE

J.K.K. NATTRAJA COLLEGE OF PHARMACY

KUMARAPALAYAM – 638183

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CERTIFICATES

EVALUATION CERTIFICATE

This is to certify that the dissertation work entitled **"Prevalence Of Depression And Associated Risk Factors Among The Elderly"** submitted by the student bearing **[REG.No.261640205]** to **"The Tamil Nadu Dr. M.G.R. Medical University"**, Chennai, in partial fulfillment for the award of Degree of **Master of Pharmacy** in **Pharmacy Practice** was evaluated by us during the examination held on.....

Internal Examiner **External Examiner**

CERTIFICATE

This is to certify that the dissertation **"Prevalence Of Depression And Associated Risk Factors Among The Elderly"** is a bonafide work done by **Reg.No.261640205,** Department of Pharmacy Practice, J.K.K. Nattraja College of Pharmacy, Kumarapalayam, in partial fulfillment of the University rules and regulations for award of **Master of Pharmacy** in **Pharmacy Practice** under my guidance and supervision during the academic year 2016-2017.

Dr.R. SAMBATH KUMAR, M.Pharm,Ph.D.,
Principal,
J.K.K.Nattraja College of Pharmacy,
Kumarapalayam-638 183.

Dr.N.VENKATESWARAMURTHY, M.Pharm,Ph.D.,
Professor and Guide,
Department of Pharmacy Practice,
J.K.K.Nattraja College of Pharmacy,
Kumarapalayam-638 183.

Place: Kumarapalayam
Date:

CERTIFICATE

This is to certify that the work embodied in this dissertation en titled dissertation **"Prevalence Of Depression And Associated Risk Factors Among The Elderly",** submitted to "**The Tamil Nadu Dr.M.G.R. Medical University**", Chennai, in partial fulfillment to the requirement for the award of Degree of **Master of Pharmacy** in **Pharmacy Practice**, is a bonafide work carried out by **Mr.MUHAMMED SHAHEER .K, [REG.No.261640205]**during the academic year 2016-2017, under the guidance and direct supervision of **Dr. N.Venkateswaramurthy, M.Pharm., Ph.D.,** Professor and Head, Department of Pharmacy Practice, J.K.K. Nattraja College of Pharmacy, Kumarapalayam.

Dr.R. SAMBATH KUMAR, M.Pharm,Ph.D.,
Professor & Principal,
J.K.K.Nattraja College of Pharmacy.
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Place: Kumarapalayam
Date:

Dr.N.VENKATESWARAMURTHY, M.Pharm,Ph.D.,
Professorand Head,
Department of Pharmacy Practice,
J.K.K.Nattraja College of Pharmacy.
Kumarapalayam-638 183.

DECLARATION

DECLARATION

I do hereby declared that the dissertation **"Prevalence Of Depression And Associated Risk Factors Among The Elderly",** submitted to "**The Tamil Nadu Dr. M.G.R Medical University"**, Chennai, for the partial fulfillment of the degree of **Master of Pharmacy** in **Pharmacy Practice,** It is a bonafide research work has been carried out by me during the academic year 2016-2017, under the guidance and supervision of **Dr. N. Venkateswaramurthy, M.Pharm., Ph.D.,** Professor, Head, Department of Pharmacy practice, J.K.K. Nattraja College of Pharmacy, Kumarapalayam.

I further declare that this work is original and this dissertation has not been submitted previously for the award of any other degree, diploma, associate ship and fellowship or any other similar title. The information furnished in this dissertation is genuine to the best of my knowledge.

Place: Kumarapalayam

Date:

Mr. MUHAMMED SHAHEER .K

[REG.No.261640205]

Dedicated to Parents,
Teachers &
My Family

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Mr. MUHAMMED SHAHEER .K

[REG.No.261640205]

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INTRODUCTION

1. INTRODUCTION

INTRODUCTION[1]

Late-life depression refers to depressive syndromes defined in the American Psychiatric Association's Diagnostic and Statistical Manual (DSM-IV) and in the International Classification of Diseases (ICD-10) that arise in adults older than age 65 years. In old age, depressive syndromes often affect people with chronic medical illnesses, cognitive impairment, or disability. Beyond personal suffering and family disruption, depression worsens the outcomes of many medical disorders and promotes disability.[2,3] Although progress has been made in characterizing the presentation of latelife depression and in improving its treatment, it continues to have detrimental consequences.[4] Here, I offer a review of the available published work on diagnosis, pathophysiology, prevention, and management of late-life depression.

Diagnosis

For a diagnosis of major depression to be made, DSM-IV and ICD-10 state that either depressed mood or loss of interest or pleasure must be present (panel 1). Although not part of the diagnostic criteria, late-life major depression is often associated with peripheral body changes and cognitive impairment. Changes to the body include hypercortisolaemia, increased abdominal fat, decreased bone density, and increased risk for type 2 diabetes and hypertension.[5] Non-demented elderly people with major depression often have difficulties with concentration, speed of mental processing, and executive function.[6,7] These deficits improve, but do not completely resolve, after remission of late-life depression.[8-10] Psychotic depression is diagnosed in patients with major depression who have delusions or hallucinations. The themes of depressive

delusions are guilt, hypochondriasis, nihilism, persecution, and sometimes jealousy. Dysthymic disorder is a syndrome of depression of mild or moderate severity that lasts at least 2 years (panel 1). Minor depression (panel 1) in elderly people is associated with functional disability, and about 25% of patients develop major depression within 2 years.[11,12] In very elderly patients, a long subsyndromal phase of up to 3 years can precede major depression.[13] Depression is also sometimes a phase of bipolar disorder. Bipolar disorder I (most recent episode depressed) is diagnosed in patients with major depression who have a history of at least one manic or mixed episode, and bipolar disorder II is diagnosed in those who have bouts of major depression and a history of hypomanic episodes. Elderly patients with bipolar disease have severe and disabling episodes,[14] increased mortality compared with their peers,[15] and are high users of mental health and other medical services.[16,17]

Epidemiology

1–4% of the general elderly population has major depression,[3] equivalent to an incidence of 0.15% per year. Twice as many women as men are affected. Both the prevalence and the incidence of major depression double after age 70–85 years. Similarly, the number of elderly people with bipolar disorder is increasing, because the absolute number of old people is rising and, possibly, because the proportion of elderly individuals with this illness is increasing.[18] Minor depression (panel 1), has a prevalence of 4–13%.[3] Dysthymic disorder, characterised by low-intensity symptoms of depression that last 2 years or longer, occurs in about 2% of elderly people. An elderly person is as likely or slightly less likely to have clinically significant symptoms of depression than someone who is middleaged (prevalence 8–16%),[3] but a very old person is particularly prone to this disorder.76 An increase in disability and cognitive impairment, a fall in

socioeconomic status, and the high proportion of women who survive their partner's death might explain this pattern.[3]

The prevalence of late-life depressive syndromes is higher in medical settings than in the community. 10–12% of patients admitted to hospital have major depression, whereas the prevalence among primary-care patients is 6–9%.[3]Additionally, 6% of primary-care patients have minor depression and 10% subsyndromal depression. However, more than half of patients with less severe types of depression remain depressed a year later.[19]The prevalence of major depression among individuals who live in nursing homes is 12–14%, though 17–35% of those in long-term care have minor depression or clinically significant symptoms of depression.[3]

Pathophysiology

Dorsal neocortical structures are hypometabolic and ventral limbic structures are hypermetabolic during depressed states.[20,21] Similar changes arise in experimentally induced sadness,[21] but are quickly reversed when stimuli are removed. The persistence of the changes in depressed patients suggests that additional biological factors predispose to depression and sustain depressive symptoms. Frontostriatal pathways in the brain mediate positive affect-guided anticipation, and abnormalities might result in an inability to anticipate incentives, thus predisposing to depression. The left medial orbitofrontal cortex is activated in response to reward and the right orbitofrontal cortex in response to punishment.[22] Furthermore, the anterior cingulate gyrus has connections to brain structures, subserving functions often impaired in depression.[23]Theperigenual cingulate assesses conflicts between current function and information with motivational consequences. The dorsal cingulate monitors competing responses and modulates attention and executive functions in collaboration with the dorsolateral

cortex.[23]Frontostriatal dysfunction could predispose to late-life depression. Executive dysfunction, a clinical expression of frontostriatal abnormalities, is common in late-life depression[6,7] and persists after improvement of mood-related symptoms.[8,10] Additionally, subcortical disorders that compromise frontostriatal pathways are often complicated by depression and executive dysfunction.[24] Low volumes of frontostriatal structures have been documented in late-life depression,[25] as have hyperintensities in subcortical structures and their frontal connections.[26]

Macromolecular abnormalities in the genu and splenium of the corpus callosum, the right caudate nucleus, and the putamen are seen in elderly people with depression.[27] Reduction in glia of the subgenual anterior cingulate[28] and abnormalities in neurons of the dorsolateral cortex have also been observed in depressed patients.[29]Frontostriatal dysfunction affects the presentation and course of late-life major depression, increasing executive dysfunction and psychomotor retardation and resulting in greater feelings of apathy.[26] Executive dysfunction generally results in a slow, poor,[30] and unstable response to antidepressants. White-matter abnormalities are associated with executive dysfunction and poor outcomes of late-life depression.[31-33]Hypometabolism of the anterior cingulate was reported[21] in treatment-resistant major depression, while hypermetabolism arose in depressed patients with favourable treatment response. Increased left frontal error negative wave amplitude after a response inhibition task, a function mediated by the anterior cingulate, predicts limited or slow change of major depression in elderly individuals treated with citalopram.[34] Abnormalities of the amygdala might predispose to depression (figure). The amygdala mediates emotions in response to aversive stimuli[35] and signals to centres responsible for coping behaviour and autonomic activity.[36] Age-related changes associated with attenuation of emotional perception could contribute to depressed or apathetic states. Stroke and subcortical disorders can damage the

connections between the amygdala, the medial dorsal thalamic nucleus, and the orbital and medial prefrontal cortex, predisposing to depression.[32] Additionally, hypercortisolaemia, which arises during chronic medical illnesses, is associated with increased activity of the amygdala, leading to release of cortisol and depression (figure).[37,38] During their first episode of major depression, patients have larger amygdala volumes than those with recurrent depression or healthy controls.[39-41] Increased activity in this part of the brain is associated with symptoms of depression and negative emotions, and might be a result of its inadequate inhibition by prefrontal centres.[40] Increased activity of the amygdala combined with inadequate cortical modulation of its emotional output probably contribute to depressive symptoms. Hippocampal abnormalities could also predispose to depression, since the volume of this structure is reduced during a first episode of major depression.[41,42] However, some disagree with this theory.[43] Nevertheless, a reduction in the volume of the hippocampus is correlated with lifetime duration of depression.[44] Moreover, a decline in hippocampal volume has been documented[45] after a first episode of major depression even in patients who received antidepressants. Hippocampal abnormalities are relevant to the elderly population, since this structure is particularly vulnerable to aging and aging-related changes. Moreover, the CA1 hippocampal region and the subiculum are vulnerable to ischaemia[45] and to hypercortisolaemia, resulting from stress and chronic medical illness.[46]

ETIOLOGY[47]

Biological

Any discussion of the biological etiology of depression must begin with medical illness, for depression among the medically ill in late life is almost ubiquitous, as just documented. In addition to the association of depression with dementing disorders,

cardiovascular disease, and hip fractures, among patients with Parkinson's disease, 20% meet criteria for major depression and 21% meet it for minor depression.[48] Depression has been associated with pain in institutionalized elderly people[49] and is also common among homebound elders with urinary incontinence.[50] Both alcohol dependence and major depression pose significant risk for the development of the other disorder at 1-year follow-up.[51] In a series of recently reported studies, diastolic hypotension was associated with low positive affect, whereas systolic hypertension was associated with a positive affect. Use of antihypertensive medication was independently associated with lower positive affect in elderly people.[52] Male veterans who were hospitalized during World War II for head injury were more likely to report major depression in subsequent years.[53]

Great interest has arisen in recent years to search for genetic susceptibility to mood disorders across the life cycle.[54]In a community sample of elderly twins, genetic influences accounted for 16% of the variance in total depression scores on the CES-D and 19% of psychosomatic and somatic complaints. In contrast, genetics contributed a minimal amount to the variance in reports of depressed mood and psychological well-being.[55] Yet the likelihood of identifying a family history of mood disorder in a clinically depressed older adult is lower than for persons in midlife. In a clinical study, the risk for immediate relatives of patients with depression whose onset occurred after age 50 was 8.3% compared with 20.1% for relatives of patients whose onset occurred at a younger age.[56]

Attention has been directed to specific genetic markers for late-life depression. Given the great interest in the e4 allele of the apolipoprotein E gene, a number of studies have focused on this susceptibility gene for Alzheimer's disease. No association was found in a community sample between e4 and depression.[57] In another study, hyperintensities in

deep white matter but not in the periventricular white matter were associated with depressive symptoms, especially in elders carrying the e4 allele.[58] Other investigators have concentrated on genes possibly associated with vascular lesions in the central nervous system. In one study, patients with late onset depression had an increased rate of the C677T mutation of the MTHFR (methylene tetrahydrofolatereductase) enzyme. This mutation may place older persons at risk for vascular depression. CADASIL (cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy) is a disease of the notch 3 gene. Depression is one of the initial symptoms in this condition, suggesting that genetic polymorphisms or mutations may predispose older adults to vascular depression.This genotype, however, is rare.[59,60]

Much attention has been directed to vascular risk for latelife depression, and this attention dates back at least 40 years, although the advent of magnetic resonance imaging boosted interest considerably.[61-64] Recent studies suggest that vascular lesions in selected regions of the brain may contribute to a unique variety of late-life depression— hence the interest in vascular depression as just discussed. The vascular depression impairments resemble impairments exhibited in frontal lobe syndromes. Magnetic resonance imaging of depressed patients has revealed structural abnormalities in areas related to the cortical–striatal–pallidal– thalamus–cortical pathway[65], including the frontal lobes[66], caudate[67], and putamen[68]. These circuits are strongly implicated in the development of spontaneous performance strategies demanded by executive tasks. Recent interest has also focused on a smaller size of the orbital frontal cortex in late-life depression[69]. In addition, left hippocampal volume has been found to be smaller in depressed elders who develop dementia over time[70]. The frontal white matter (not gray matter) lesions in late-life depression are associated with increased myoinositol–creatinine and choline–creatinine

ratios. These changes may reflect biological changes in nonneural (glial) tissue, which in turn affects synaptic activity.[64]

Serotonin activity, specifically, 5 HT2A receptor binding, decreases dramatically in a variety of brain regions through midlife, but there is less decrease from midlife to late life. These 5 HT2A receptors in normal healthy subjects decreased markedly from young adulthood to midlife (70%from the levels at age 20 through the fifth decade), and then leveled off as age advanced. Receptor loss occurred across widely scattered regions of the brain (anterior cingulated, occipital cortex, and hippocampus). The relationship of serotonin depletion can also be studied indirectly by the study of radioisotope-labeled or tritiated imipramine binding (TIB) sites. There is a significant decrease in the number of platelet-TIB sites in elderly depressed patients, compared with elderly controls and individuals suffering from Alzheimer's disease.[71]

In aged monkeys (Macacamulatta), significant agerelated decreases in 5 HT1A receptor binding were observed only in the frontal and temporal cortices. In the hippocampus, although 5 HT1A receptor binding indicated nonsignificant age-related changes, the degree of displacement when binding to a receptor agonist was decreased in the aged monkeys. This finding suggests that age-related impairment of 5 HT1A receptor response might be related to the reduced efficacy of antidepressant therapy in elderly patients with depression.[72] Endocrine changes have also been associated with latelife depression. Although the dexamethasone suppression test was long ago ruled out as a diagnostic test for depression, nonsuppression of cortisol is associated with late-life depression compared with age-matched controls.[73] Depression is associated with hypersecretion of corticotropinreleasing factor (CRF), which is thought to mediate sleep and appetite disturbances, reduced libido, and psychomotor changes.[74] Aging is associated with an

increased responsiveness of adrenocorticotropic hormone (ACTH), cortisol, and dehydroepiandrosterone sulfate (DHEA-S) to CRF.[75]

Low levels of DHEA have been associated with higher rates of depression and a greater number of depressive symptoms in community-dwelling older women.[76] Total testosterone levels were lower in elderly men with dysthymic disorder than in men with major depressive disorder and men without depressive symptoms in another study.[77] However, the efficacy of testosterone in treating depression has not been established.[78] Depression has also been associated with postprandial systolic hypotension.[79] Hormone replacement in women has been associated with improvements in mood.[80] Psychological Behavioral, psychodynamic, and cognitive aberrations have all been suggested as causes of late-life depression. Three examples will illustrate these proposed etiologies. The behavior of learned helplessness, originally used to described the increasingly passive behavior of dogs produced by inescapable shock, has been expanded to explain depressive symptoms across the life cycle, suggesting that the cause of depression is the expectation that initiating action in a continually stressful environment is futile.[81,82] The association of depression with severe or frequent adverse life events could be interpreted in part as a behavioral response to continued adverse stressors. Depression in old age has been associated with emotional abuse and neglect during childhood, as well as relational stress and problem behavior of significant others during late adulthood (especially high when many events reported during adulthood and late adulthood).[83] In a meta-analysis, the number of total negative life events and daily hassles was associated with depression in elderly people.[84] Severe events show the largest relative risk, but ongoing difficulties account for the most episodes. The association of severe events with onset tends to be stronger in first than in recurrent episodes. Mild events can trigger a recurrence but not a first episode, suggesting that once the development of the behavior of ‘‘depression’’

follows a stressor, the triggers for subsequent episodes of depression need not be severe thereafter.[85]

According to one psychodynamic theory, the search for restitution secondary to the inevitable losses in late life is a major developmental task for aging individuals and a depression-like syndrome may appear, a ''depletion syndrome,'' when this task is not accomplished successfully. If one lives long enough, the inevitable object loss, body change, and disease lead to a state of both internal and external depletion.[86] A more recent yet controversial theory complements the depletion theory, suggesting that successful aging is associated with ''selective optimization with compensation''.[87] This model is based on a recognition by the elder of the realities of aging, especially the losses. Such recognition leads to selection of realistic activities, optimization of those activities, and compensation for lost activities, which in turn leads to a reduced and transformed life.

Perhaps the most dominant psychological model of depression is the model of cognitive distortions.[88]In a case-control study, patients with major depression perceived greater negative impact of life events than patients with dysthymic disorder and healthy controls.[89] The interpretation of life events is the key to understanding depression under this theory. Cognitions may be distorted such that the elder has unrealistic expectations, overgeneralizes certain adverse events, over reacts to events, and personalizes events. Perceived negative interpersonal events are associated with depression in elders, particularly in those who demonstrate a high need for approval and reassurance in the context of interpersonal relationships. In contrast, negative achievement events are associated with depression in those who placed a heavy emphasis on personal success and control. This conceptualization is consistent with the diathesis-stress model, namely that

negative experience best predicts depression when a specific type of event affects a personal vulnerability.[90,91]

Social

The association between late-life depression and impaired social support has been established for many years. In a community study in Hong Kong,[92] impaired social support and depression were associated (including network size, network composition, social contact frequency, satisfaction of social support, and instrumental–emotional support). Impaired social support is associated with poorer outcome of depression in older men but not older women.[93] In female caregivers of demented elderly people, the prevalence rate of depressive disorders reaches 45–47%, and these women are twice as likely to use psychotropic drugs.[94,95] Loneliness may be a key factor in depression among caregivers.[96] Some have attempted to couple the theory of social disengagement with aging (much debated in the literature) with depression, suggesting that some symptoms of depression, such as lack of social interest and greater self-involvement, mirror attributes of older adults according to Disengagement Theory.[97,98] Other factors being equal, it is probable that elders who are less socially engaged are more depressed. For example, elders who stopped driving had a greater risk of worsening depressive symptoms.[99]

Spiritual and Existential

Religious practice is associated with less depression in elderly Europeans (EURODEP), both on the individual and the national level. This is especially true when religious practice is embedded within a traditional value orientation.[100] Some investigators have proposed that ‘‘religious coping’’ (subjects perceiving that religion is the most important factor in coping) is associated with improved emotional and physical health.[101,102] They

found that religious coping was associated with a decrease in certain types of depressive symptoms, including loss of interest, feelings of worthlessness, withdrawal from social interactions, loss of hope, and other cognitive symptoms of depression. Religious coping was not associated with a reduction in somatic symptoms.

DIAGNOSTIC EVALUATION

Much of the diagnostic workup of late-life depression derives from what we know about symptom presentation and etiology (see Table 2). Basically, the diagnosis is made on the basis of a history augmented with a physical and finetuned by laboratory studies. There is no biological marker or test that makes the diagnosis, though for some subtypes of depression, such as vascular depression, the presence of subcortical white matter hyperintensities on magnetic resonance imaging scanning are critical to the diagnosis.[83]

Screening is beneficial when standardized screening scales such as the Geriatric Depression Scale (GDS) or the CES-D are used.[103]Screening in primary care is critical. Not only is the frequency of depression high, but suicidal ideation is high as well. The prevalence of serious suicidal ideation in one primary care setting was 1% and the prevalence approaches 5% among older adults who report significant symptoms of depression.[104,105] However, the documented success of screening has been mixed in extant studies. Internists tend to accept responsibility for treating late-life depression but perceive their clinical skills as inadequate and are frustrated with their practice environment.[105] Nearly all studies of treatment efficacy with pharmacotherapy or psychotherapy focus on older adults with uncomplicated major depression, which may apply to less than 15% of the depressed people in primary care.[106] Primary care physicians were informed of patient-specific treatment recommendations for depressed patients 601years of age in one controlled study. The patients of physicians in the

intervention group were more likely to be diagnosed with depression and prescribed antidepressant medications, though the outcome of the depression was no better for the intervention group than for the control group.[107] Cognitive status should be assessed with the Mini-Mental State Examination (MMSE), given the high likelihood of comorbid depression and cognitive dysfunction.[108] Nutritional status is most important to evaluate in the depressed elder, including height, weight, history of recent weight loss, lab tests for hypoalbuminemia, and cholesterol, given the risk for frailty and failure to thrive in depressed elders, especially the oldest old. General health perceptions[109] as well as functional status (activities of daily living) should be assessed for all depressed elderly patients.[110,111] Other factors critical to assess in the diagnostic workup include social functioning,[112] medications (many prescribed drugs can precipitate symptoms of depression), mobility and balance, sitting and standing blood pressure, blood screen, urinalysis, chemical screen (e.g., electrolytes, which may signal dehydration) and an electrocardiogram if cardiac disease is present (especially if antidepressant medications are indicated).

EPIDEMIOLOGY OF DEPRESSIONAMONG ELDERLY IN INDIA[113]

Compared to other aspects of depression in elderly a significant amount of literature is available on the prevalence of depression among elderly and many studies have been conducted in the last decade. As shown in Table, we could locate 53 studies which have evaluated the prevalence of depression among elderly.

These studies have been done in various set-ups such as community, psychiatric clinics,[114] inpatients in a hospital,[114, 115,116] and outpatient of medical clinics[117,118,119,120] etc. Occasional studies have also looked at the prevalence of depression in special populations like elderly living in old age homes.[121-124] However, most of these studies are

community-based. The sample has largely been recruited from preassigned rural areas and urban slums. Few authors have recruited the entire population living in a village by house to house surveys, while others have selected the study population using various randomization techniques to recruit the sample. The most common instrument that has been used to evaluate depression has been Geriatric Depression Rating Scale (GDS), used in 24 of the 53 studies. Other instruments that have been used to diagnose depression include international classification of diseases (ICD), tenth revision (ICD- 10) criteria, patient health questionnaire-9, Zung depression scale, and case detection schedule, etc.

In most of the studies, the age cut-off which has been used to identify elderly patients is 60 or above. The sample size in community-based studies has ranged from as low as 70 to as high as 7150 and prevalence of depression has ranged from 8.9% to 62.16%. Some of the community-based studies have evaluated the prevalence of other psychiatric disorders too and have reported depression/affective disorders to be the most common psychiatric morbidity. In a review of world literature, Barua*et al.,* (2011)[125] evaluated the median prevalence rates of depression in elderly population of India and compared the same with the rest of the world. The median prevalence rate of depression among elderly was reported to be 18.2%, which was significantly higher than the rest of the world (5.4%). However, it is important to note that the comparison was based on only six relevant studies from India, which formed only 0.5% of total study sample evaluated, in contrast to the 68 studies from the rest of the world covering 99.5% of the participants. The largest community-based data arising from India come from the study on Global aging and adult health Wave-1 study.[126]This study was conducted from 2007 to 2010 in six countries (China, Ghana, India, Mexico, Russian Federation, and South Africa) across the world. Depression was diagnosed on the basis of reporting of one or more of three symptoms (1) had a sad, empty, or depressed feelings (2) lost interest in most things that they usually

enjoy such as personal relationships, work, hobbies/recreation, and (3) decreased energy or feeling tired all the time for 2 weeks in 12 months.

Multistage, stratified, random cluster sampling design was used and those above 18 years of age were recruited. Data of those above 50 years of age extracted from this study show that the prevalence of depression among those aged above 50 years is highest in India (27.1%) followed by Mexico (23.7%), Russia (15.6%), Ghana (11%), South Africa (6.4%), and least in China (2.6%). Prevalence of depression in clinic-based studies has ranged from 42.4% to 72%. The sample has varied from patients attending psychiatry units to multidisciplinary wards. Studies that have compared patients with specific medical illnesses with those without illnesses, in general, suggest that elderly patients with medical illnesses such as diabetes mellitus have a higher prevalence (42.4% versus 18%) of depression.[118]

2. LITERATURE REVIEW

1. Swarnalatha N[127] *et al* (2013)

The main objective of the study was to assess the prevalence of depression among the elderly and to determine the epidemiological factors which are associated with depression. The study conducted a cross-sectional, observational, community based study. The individuals who were aged 60 years and above were interviewed and examined. This study was conducted through house-to-house visits in the selected villages. Four hundred subjects were included. The data was analysed by using SPSS (Statistical Package for Social Sciences), version17. The study result shows the prevalence of depression was 47% and concluded as The prevalence of depression was found to be positively associated with increasing age, the female sex, illiteracy, a low socio-economic status, those who were living alone, those who were economically partially dependent and those who were totally dependent for the activities of daily living.

2. Anita Goyal[128] *et al* (2014)

The aim of the study was to explore the prevalence of depressive symptoms and possible co relational factors among elderly population. The study was a cross-sectional study, 100 elderly persons were screened. Geriatric depression scale (GDS) was used to assess depressive symptoms. A self-rating questionnaire was used to detect some sociodemographics and clinical variables. The result of their study shows 100 respondents interviewed, 40 were 70 years and above and 41% were male. Sixty individuals (25 males and 35 females) were found to be mildly depressed. Seventeen (4 males and 13 females) were suffering from severe depression. And they concluded as their study is in line with previous studies showing the high prevalence of depression in elderly.

3.Anisha Nakulan[129] *et al* (2015)

The aim of the study was to estimate the prevalence of depressive disorders among community resident older people in Kerala, India and to identify factors associated with late-life depression.Two hundred and twenty community resident older subjects were assessed for depression by clinicians trained in psychiatry. They used a symptom checklist based on International Classification of Diseases Tenth Revision (ICD-10) Diagnostic criteria for research for Depression and Montgomery Asberg Depression Rating Scale for assessment of symptoms. The point prevalence of depression was estimated. Univariate analysis and subsequent binary logistic regression were carried out to identify factors associated with depression. The result of the study shows prevalence of any ICD-10 depressive episode was 39.1%. and they concluded that, high prevalence rate of late-life depression is indicative of high burden due to depression among older people in the community. Better awareness among primary care clinicians can result in better detection and management of late-life depression.

4. Padayachey U[130] *et al* (2017)

The main objective of the study was to determine the prevalence of depression and associated clinical and socio-demographic factors amongst older adult patients attending a primary health care clinic in the Ethekwini District in Kwa-Zulu Natal, South Africa. They included 15-item Geriatric Depression Scale and a socio-demographic questionnaire were administered in English to 255 geriatric outpatients, randomly selected. The result of the shows, 40% of participants screened positive for depression. Female gender, widowhood and a negative subjective health status rating were significantly associated with depression and marriage appeared to be protective ($p < 0.001$). Participants with a poor subjective health rating were 21 times more likely to be depressed and widowhood conferred an almost fourfold increased risk of being depressed, with widows at greater

risk than widowers. And they concluded their study by, there is a high rate of undetected depression among the elderly attending a local primary health care clinic with widowhood and poor subjective health being strong predictors of mood disorders.

5. Sandeep G[131] *et al* (2015)

The study aim was to review the existing literature on depression among elderly arising from India. Community-based studies involving 70 to 7,150 elderly subjects report prevalence rate varying from 8.9% to 62.16%. Clinic-based studies involving 50 to 5,260 participants report prevalence rates ranging from 42.4% to 72%. Studies have reported depression to be more common among females. Other demographic factors that have been associated with depression among elderly include being unmarried, divorced or widowed elderly, residing in rural locality, being illiterate, increasing age, lower socioeconomic status, and unemployment. Depression has also been shown to be associated with various psychosocial factors, lifestyle and dietary factors, and presence of chronic physical illness. And the study concluded, that prevalence of depression among elderly in India is high. However, there is lack of data on symptom profile and limited data is available on various therapeutic interventions for the management of depression in elderly from India.

6.Paramita S[132] *et al* (2015)

The main objective of the study was to estimate the prevalence of depression and identify the associated risk factors in the elderly population. The study includes 3038 consenting elderly (>60 years old) rural and urban residents of both sexes from the field practice areas were interviewed and examined in a cross-sectional study. Physical impairment in the subjects was assessed with the Everyday Abilities Scale for India (EASI), depression by the 15-item Geriatric Depression Scale (GDS-15), and cognitive impairment by the Mini-Mental State Examination (MMSE). Data were analyzed using Epi Info version-6

software. Result of the study shows that, the prevalence of depression in the study population was 8.9% and the study concluded that, urban residence, female gender, higher age, nuclear family, poverty, and functional and cognitive impairment were found to be associated with depression even after controlling for other factors.

7. Paula A[133] *et al* (2014)

The main objective of the study was to assess the prevalence and risk of depression among older people with dementia living in LMI countries. The study analysed data from a population-based survey conducted by 10/66 Dementia Research Group in 2004. Altogether, 17 031 participants from eight different countries aged 65 years and above were assessed. Logistic regression was used to calculate prevalence and odds ratio (OR) of depression on persons with dementia. Study result shows that depression was identified in 5.8% (4.4% of men, 6.6% of women) of all the 17 031 participants and in 12.4% (18.9% of men, 10.1% of women) of the 1612 persons with dementia. And they conclude the study as, among persons with dementia, the prevalence of depression was higher for men than women, and the risk of depression varied by the type of dementia.

8. Xinghu Z[134] *et al* (2014)

The main objective of the study was to understand the prevalence of depression in a rural Chinese population and to analyze the risk factors for depression.This study used a cross-sectional approach. A total of 11,473 subjects were surveyed and completed the Patient Health Questionnaire-9 (PHQ-9) and the World Health Organization Quality of Life Brief scales. The result shows that, the prevalence of depressive symptoms in the population was 5.9%. The prevalence in women (8.1%) was higher compared with men (3.5%) and also increased with age. And they concluded that, the prevalence of depressive symptoms among rural population is higher than some southern cities in China. Dietary patterns may be an important risk factor linked to this disorder in the Chinese rural population.

9. Ankur B[135]*et al* (2010)

The main objective of the study was to determine the prevalence of depression among the elderly population of rural areas of Udupi district and to determine the validity and reliability of WHO (five) Well-being Index (1998 version) as a screening instrument to identify depressive disorders in elderly population in this Indian setting. This study used a cross-sectional study deign, that was conducted over a period of eight months (from March 1 to October 31, 2002) in the three taluks of Udupi, Kundapura, and Karkala; belonging to the Udupi district of South India. We selected 627 people in the age group of 60 years and above for the study. The result of the study shows that, the prevalence of depression in elderly population was determined to be 21.7% (95% CI = 18.4 - 24.9), The Indian version of WHO-five well-being index (1998 version) showed a sensitivity of 97.0%, specificity of 86.4%, positive predictive value of 66.3% and an overall accuracy of 0.89. The Kappa statistics showed significantly high reliability of k = 0.7. And they concluded that, the Indian version of "WHO (five) Well-being Index (1998 version)" was found to be an effective instrument for identifying depression in elderly Indian community.

10.Joy PP[136] *et al* (2017)

The main objective of the study was to assess the prevalence of depression and its associated factors among the elderly. They conducted as a community based cross sectional study on nutrition and health status of the elderly.Data was collected on an interview schedule in the local language among 496 the elderly persons (60 years and above) selected by multi stage sampling technique from Kancheepuram District in Tamil Nadu using semi - structured questionnaire. Nutritional assessment done using Mini Nutritional Assessment (MNA) scale, hemoglobin estimation by Cyano-methemoglobin method and depression scaleusing Geriatric Depression Scale – Short Form (15

questions). The result of the study shows, nearly half (47.8%) of the elderly were depressed. And they concluded that, Mental health services to the elderly should be incorporated in the screening services rendered in primary health care settings for a proper care and support to improve their quality of life

11. Jinghui W[137] *et al* (2017)

The aim of the study is to conduct a systematic review and meta-analysis to provide a precise estimate of the prevalence of depression or depressive symptoms among outpatients in different clinical specialties. They conducted a systematic review and meta-analysis. The result of the study shows, Eighty-three cross-sectional studies involving 41 344 individuals were included in this study. The overall pooled prevalence of depression or depressive symptoms was 27.0% (10 943/41 344 individuals; 95% CI 24.0% to 29.0%), with significant heterogeneity between studies ($p<0.0001$, $\tau 2=0.3742$, $I2=96.7\%$). And the study concluded that, a significant proportion of outpatients experience depression or depressive symptoms, highlighting the importance of developing effective management strategies for the early identification and treatment of these conditions among outpatients in clinical practice. The substantial heterogeneity between studies was not fully explained by the variables examined.

12. Manju P[138] *et al* (2017)

The main objective of the study was to ascertain the prevalence of depression among elderly in a rural population of Haryana and assess its socio-demographic correlates. This study was a community based, cross sectional study, which was conducted in Community Health Centre (CHC), Chiri of Rohtak district (Haryana, India). Of total 124 Anganwadicentres in study area, 10 were randomly selected. A total 500 elderly persons aged 60 years and above were randomly screened for depression. Long form of Geriatric Depression Scale (GDS- 30) was used with cut off score at 22.The result shows, the

prevalence of depression in the elderly was 14.4% (95% CI: 11.6- 17.8). Mean age of study population was 68.5 ± 7.7 years. And they concluded that, the prevalence of depression in the elderly was 14.4% in a rural community of north India.

3. AIM AND OBJECTIVES OF THE WORK

The Global Burden of Disease (GBD) study projections show that depression will be the single leading cause of Disability Adjusted Life Years by 2020 in the developing world.[139] The GBD 2000 estimates the point prevalence of unipolar depressive episodes to be 1.9% for men and 3.2% for women, and that 5.8% of men and 9.5% of women will experience a depressive episode in a 12-month period. These prevalence figures vary across populations and may be higher in some populations.[140] Ina meta-analysis of various study reports of community-based mental health surveys on geriatric depressive disorders in those aged 60 years and above, conducted in the continents of Asia, Europe, Australia, North America, and South America between 1955 and 2005,the median prevalence rate of depressive disorders in the world for the elderly population was determined to be 10.3%, while among the elderly Indian population, it was determined to be 21.9% [inter quartile range (IQR)11.6-31.1)].[141] Depression is the most common psychiatric disorder among the elderly,[142] and although India is the second-most populous country in the world in terms of elderly population >60 years of age,[139,140] depression in the elderly is not yet perceived as an important health problem in the country. Few community-based studies have been conducted in India so far to address this issue. Hence, this study is planned to conduct to estimate the prevalence of depression in the elderly (>60 years old) in Kumarapalayam town and to identify the major risk factors for depression in the study population.

Aim

To estimate the prevalence of depression in the elderly (>60 years old) in Kumarapalayam town and to identify the major risk factors for depression in the study population.

Objectives

1. To study the prevalence of depression in elder patients.
2. To categorize the prevalence of depression according to sociodemographic factors like age, gender etc. and according to socioeconomic status.
3. To study the risk factors of depression in a study population.

4. METHODOLOGY

A cross-sectional descriptive study was conducted to explore the prevalence of depression and its association with sociodemographic parameters and risk factors in older adult (aged ≥60 years, the accepted criterion for elderly in India) after Institutional ethical approval. The research was carried out in the Kumarapalayam Town.

The respondents were explained the purpose of the study, and their signed consent was obtained. Consent was obtained from the caregiver in the event of the subject being unable to give informed consent. Taking the prevalence of depression as 46% from a study conducted in South India,[143] and at 95% confidence limit, sample size of 382 was calculated. Taking house hold as the sampling unit, random sampling technique was followed to reach the desired sample size.

The interview was conducted in the Tamil language, for which purpose the consent form and assessment tools were translated into Tamil language and back-translated in to English by an independent coworker proficient in both languages to ensure validity of the translation. Depression was assessed using the 15-item Geriatric Depression Scale (GDS),[144] which is a 15-item self-report assessment used as a basic screening measure of depression in the elderly. Using GDS-15, scores of 0–4 were considered normal; 5–8 indicated mild depression; 9–11 moderate depression and 12–15 severe depression. Accuracy of the GDS-15 is not influenced by the severity of medical burden, age, or other sociodemographic characteristics and even the "very old" and ill can be screened appropriately.[145]

The remaining data was collected using a predesigned and pretested questionnaire.[146]All participants were assessed face to face and socio-demographic data and risk factors were

obtained in the same interview. Information regarding marital status, education status, occupation, substance abuse, presence of chronic diseases like diabetes, hypertension and other associated risk factors were also collected.

Inclusion and Exclusion Criteria: All persons aged ≥ 60 years willing to participate on a voluntary basis and without any psychiatric morbidity were included. Those with any psychiatric morbidity and without consent were excluded. Individuals above 60 years of age not residing in the study area, residing in old age homes and critically ill were excluded. The deaf/dumb/blind, those with diagnosed psychiatric illness (schizophrenia, mental retardation) or neurological disorders (Parkinsonism, severe head injury, or brain neoplasm), and those who were ill at the time of the study were excluded, as there was no way to obtain reliable information from them.

Data analysis, data entry and statistical analyses used SPSS version 17. Frequency distributions were calculated for all variables. The chi-square test was used to test significance of associations between independent variables and depression, with the threshold for significance set at $p = 0.05$.

5. RESULTS

TABLE 1: Gender and Age wise distribution of the participants

S.No.	Gender	Number of Elder participants (n=382)	Percentage (%)
1	Male	184	48.17
2	Female	198	51.83
S.No.	**Age in years**	**Number of Elder participants (n=382)**	**Percentage (%)**
1	60-70	187	48.95
2	71-80	145	37.95
3	More than 81	50	11.54

FIGURE 1(a): Gender wise distribution of the participants

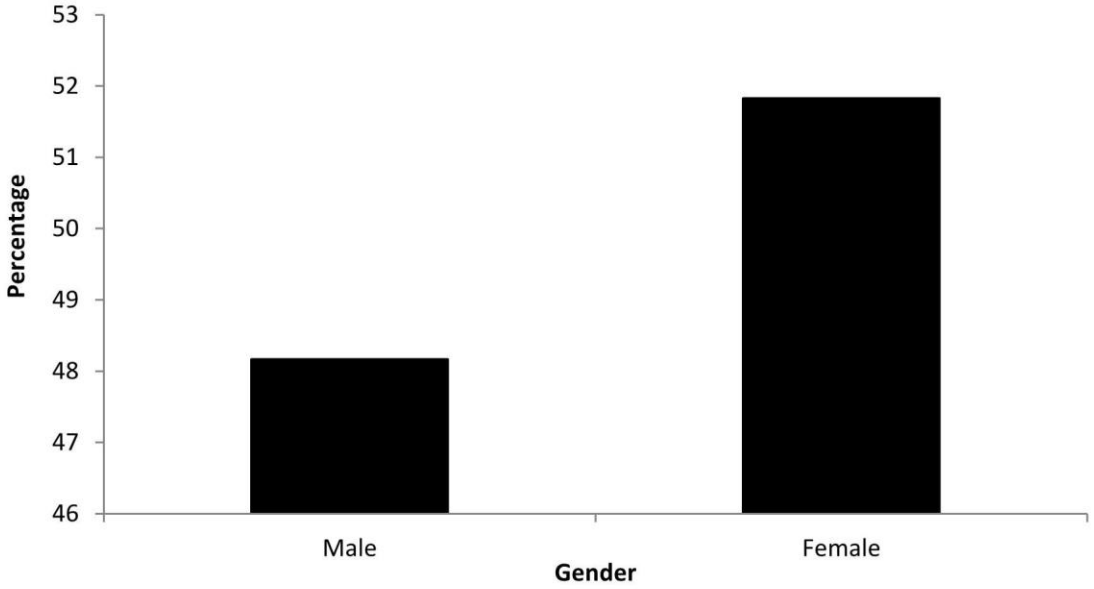


FIGURE 1(b):Age wise distribution of the participants

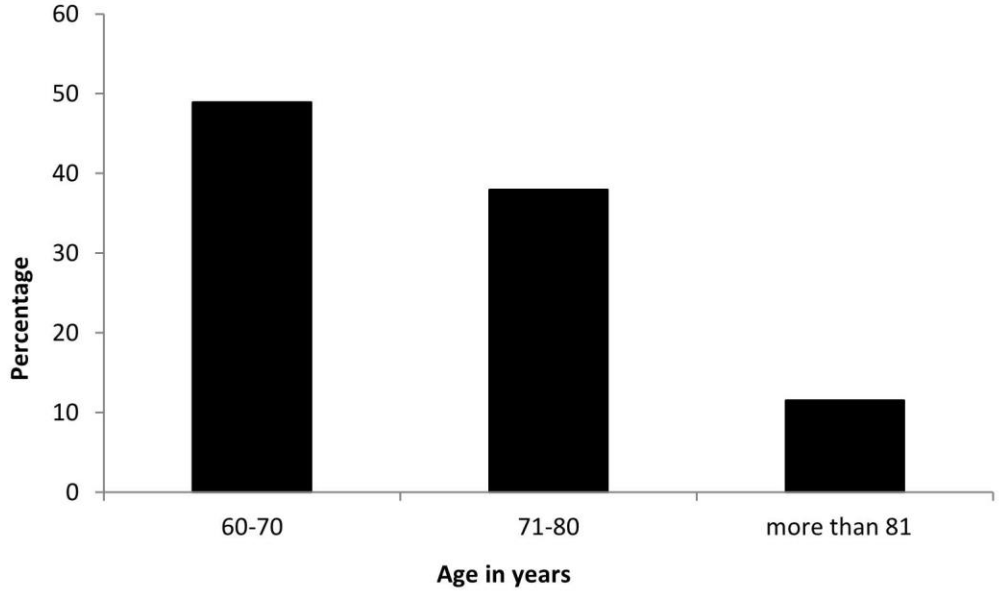


TABLE 2: Distribution of GDS-15 Scores (n=382)

S.No	GDS-15 Scores	Depression Symptoms	Distribution of GDS-15 Scores (n=382)	Percentage (%)
1	0-4	Absent	174	45.55
2	5-8	Mild	108	28.27
3	9-11	Moderate	66	17.28
4	12-15	Severe	34	8.90

FIGURE 2: Distribution of GDS-15 Scores (n=382)

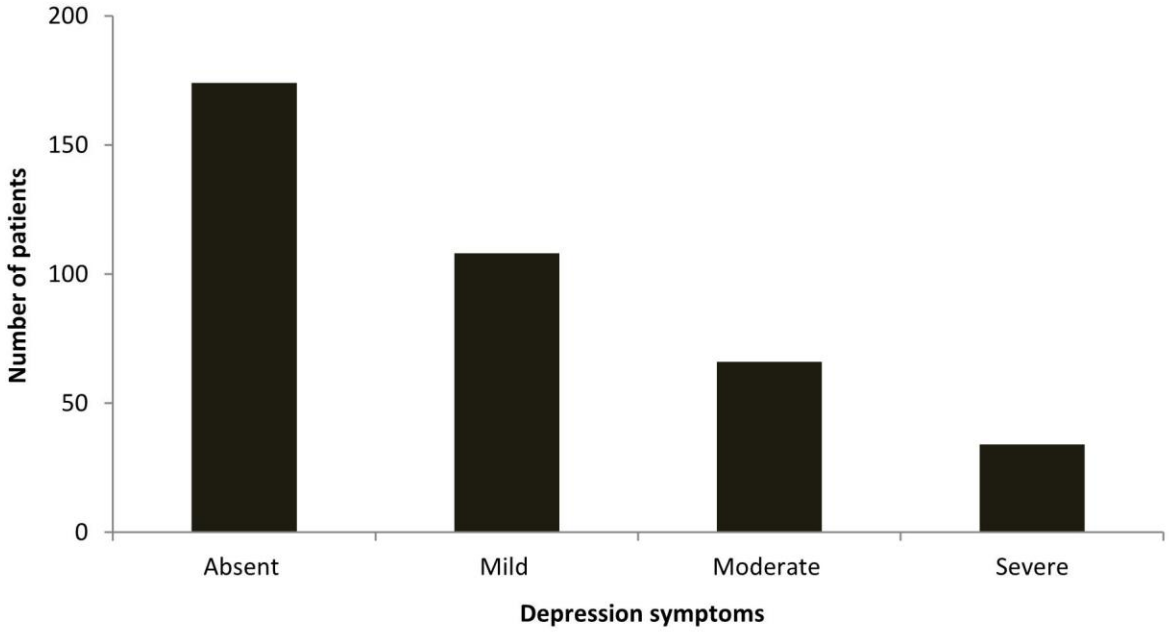


TABLE 3: Gender-wise distribution of Prevalence of Depression

S.No.	Gender	Prevalence of Depression (n=208)	Percentage (%)
1	Male	92	44.23
2	Female	116	55.77

FIGURE 3: Gender-wise distribution of Prevalence of Depression

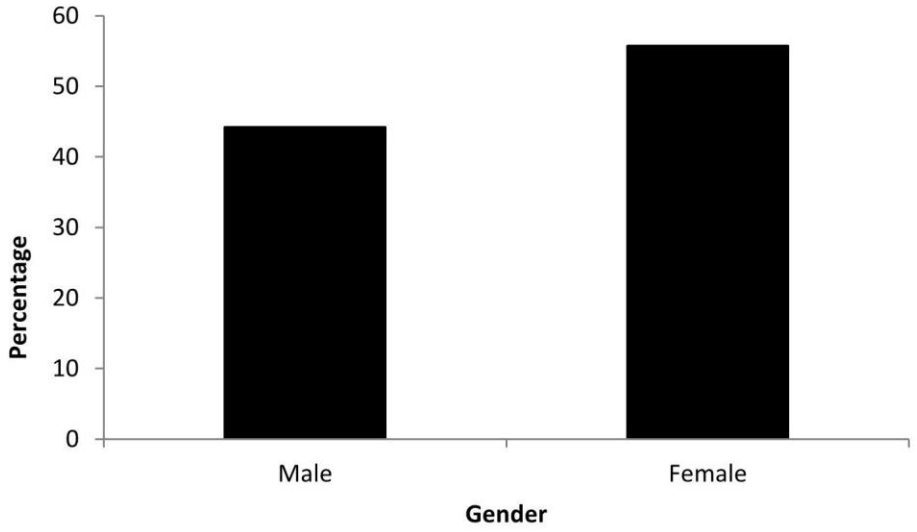


TABLE 4: Age wise distribution of the participants

S.No.	Age in years	Age of the participants (n=208)	Percentage (%)
1	60-70	79	37.98
2	71-80	113	54.33
3	More than 81	16	7.69

FIGURE 4 :Age wise distribution of the participants

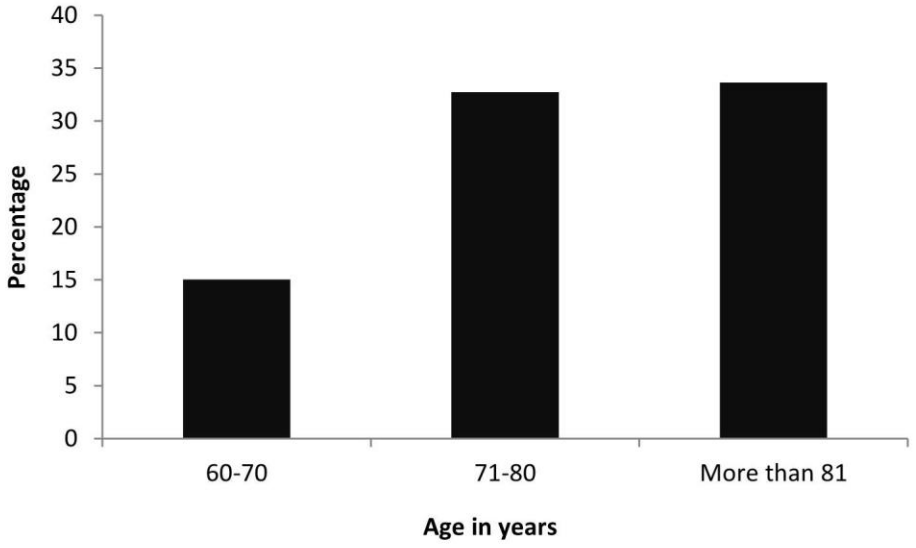


TABLE 5: Prevalence of Depression

S.No.	Marital status	Prevalence of Depression (n=208)	Percentage (%)
1	Living with spouse	132	63.46
2	Either spouse expired	61	29.33
3	Other	15	7.21

FIGURE 5: Prevalence of Depression

TABLE 6: Literacy level of the depressive elders

S.No.	Educational status	Prevalence of Depression (n=208)	Percentage (%)
1	Illiterate	153	73.56
2	Literate	55	26.44

FIGURE 6: Literacy level of the depressive elders

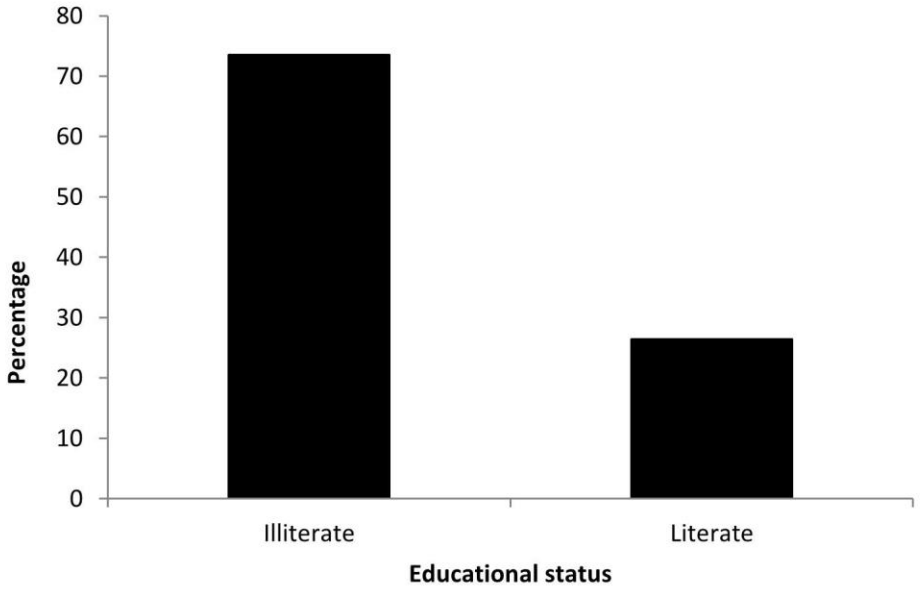


TABLE 7: Family type of depressive elders

S.No.	Family type	Prevalence of Depression (n=208)	Percentage (%)
1	Joint	141	67.79
2	Nuclear	67	32.21

FIGURE 7: Family typeof depressive elders

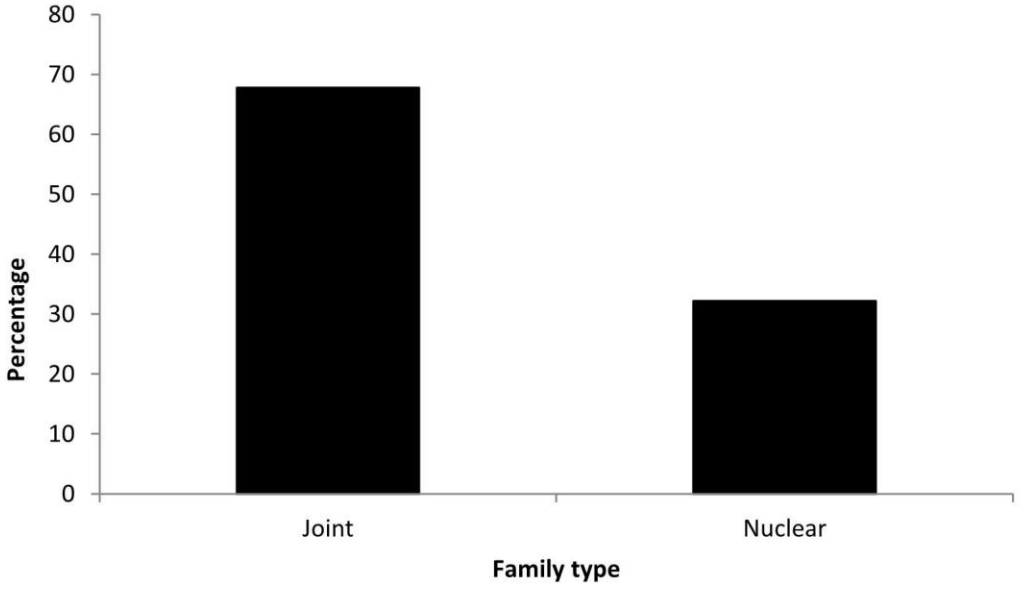


TABLE 8: Family size of depressive elders

S.No.	Family size	Prevalence of Depression (n=208)	Percentage (%)
1	Small ≤ 5	115	55.29
2	Large ≥ 5	93	44.71

FIGURE 8: Family size of depressive elders

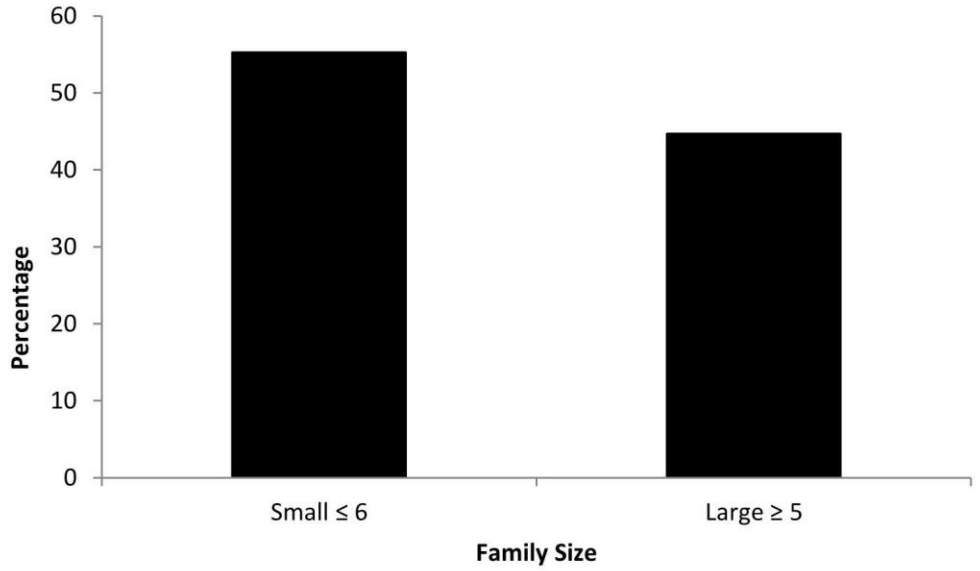


TABLE 9: Family Income of depressive elders

S.No.	Family Income	Prevalence of Depression (n=208)	Percentage (%)
1	≤ 10,000	131	62.98
2	> 10,000	77	37.02

FIGURE 9: Family Income of depressive elders

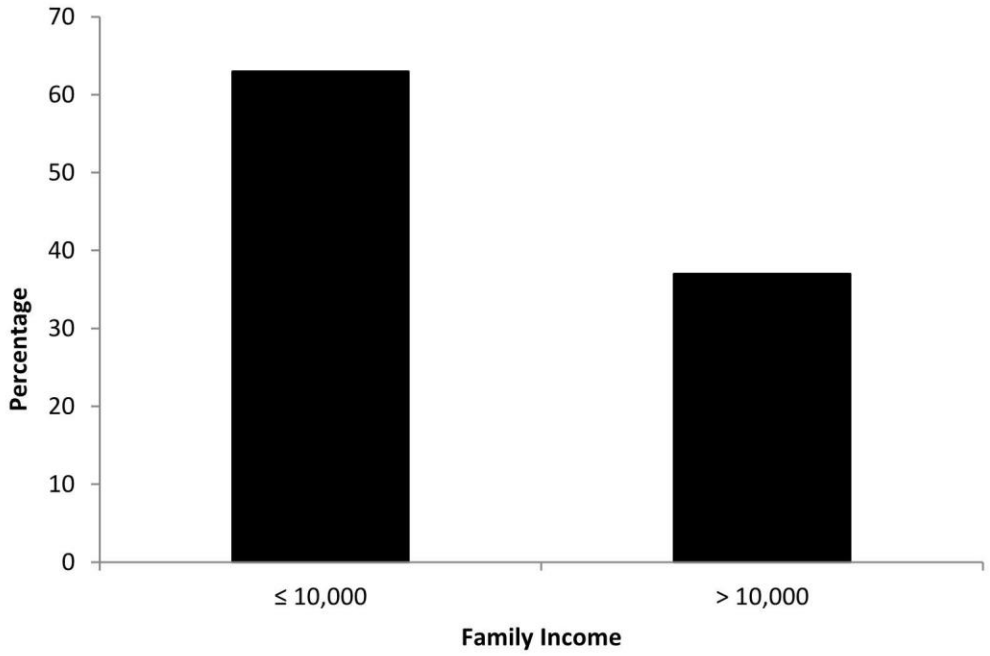


TABLE 10: Past Occupation of depressive elders

S.No.	Occupation (before 60 years)	Prevalence of Depression (n=208)	Percentage (%)
1	Professional / administrative class	45	21.63
2	Others (Includes Housewives, clerical and technical staff, teachers and others)	163	78.36

FIGURE 10: Past Occupation of depressive elders

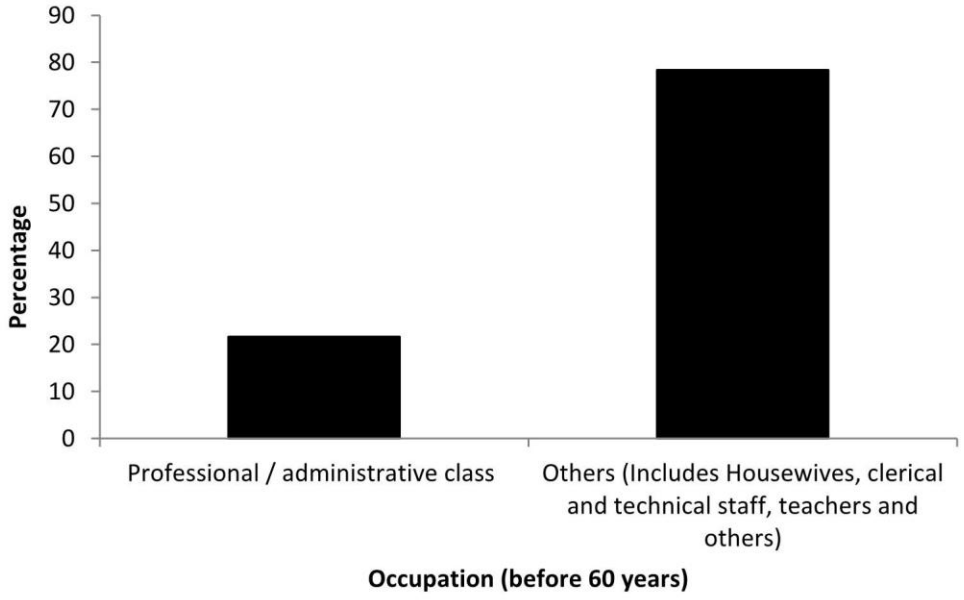


TABLE 11: Current occupation of the depressive elders

S.No.	Current occupation	Prevalence of Depression (n=208)	Percentage (%)
1	Employed	66	31.73
2	Unemployed	142	68.27

FIGURE 11: Current occupation of the depressive elders

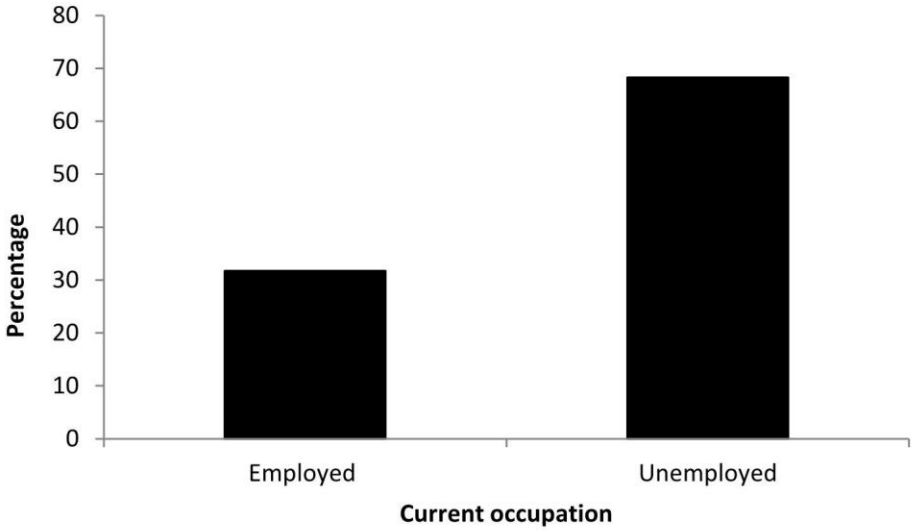


TABLE 12: Family history of psychiatric illness in depressive elders

S.No.	Family history of psychiatric illness	Prevalence of Depression (n=208)	Percentage (%)
1	Present	7	3.37
2	Absent	201	96.63

FIGURE 12: Family history of psychiatric illness in depressive elders

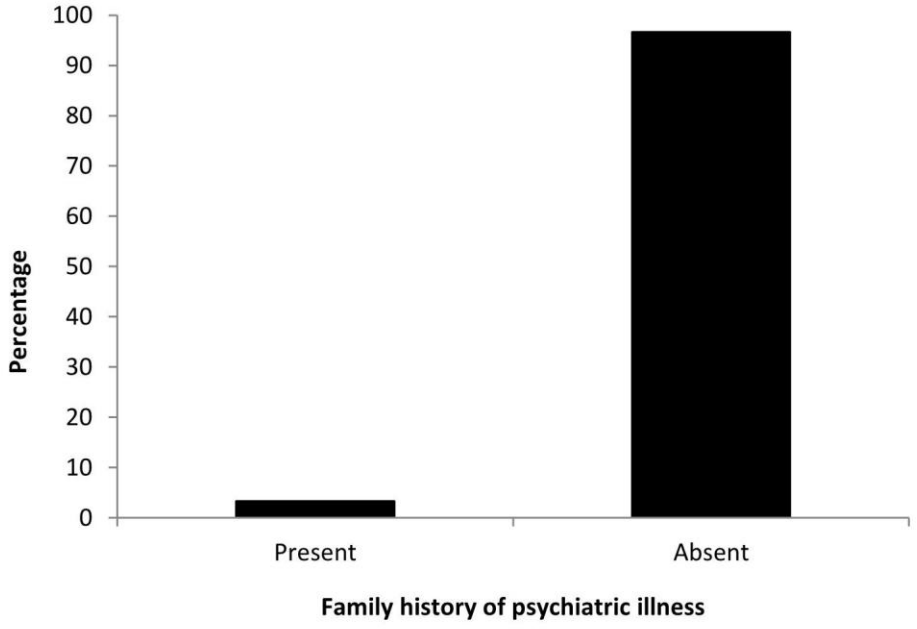


TABLE 13: History of psychiatric illness in depressive elders

S.No.	Past history of psychiatric illness	Prevalence of Depression (n=208)	Percentage (%)
1	Present	19	9.13
2	Absent	189	90.87

FIGURE 13: History of psychiatric illness in depressive elders

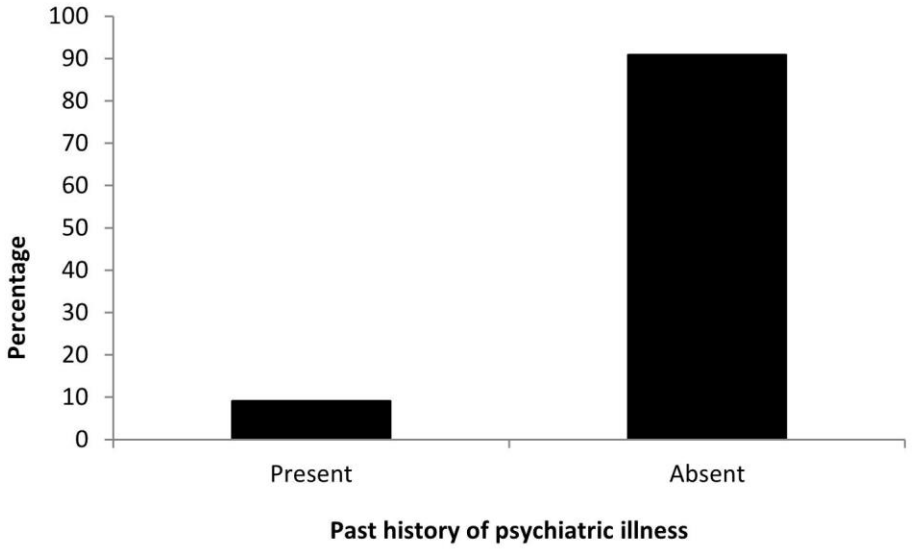


TABLE 14: History of substance abuse in depressive elders in depressive elders

S.No.	Life time history of substance abuse	Prevalence of Depression (n=208)	Percentage (%)
1	Present	14	6.73
2	Absent	194	93.27

FIGURE 14: History of substance abuse in depressive elders in depressive elders

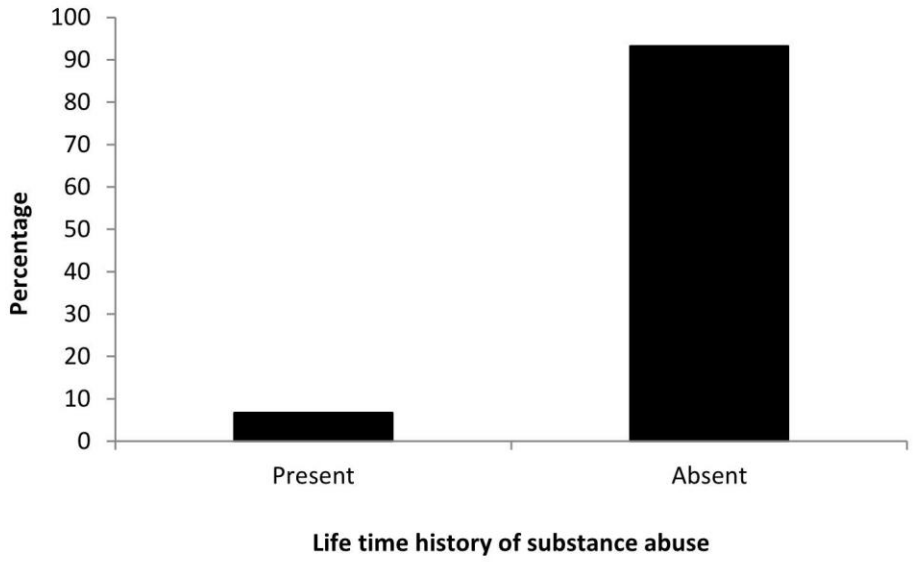


TABLE 15: Opportunities for companionship in depressive elders

S.No.	Spends day with someone	Prevalence of Depression (n=208)	Percentage (%)
1	Yes	23	11.06
2	No	185	88.94

FIGURE 15: Opportunities for companionship in depressive elders

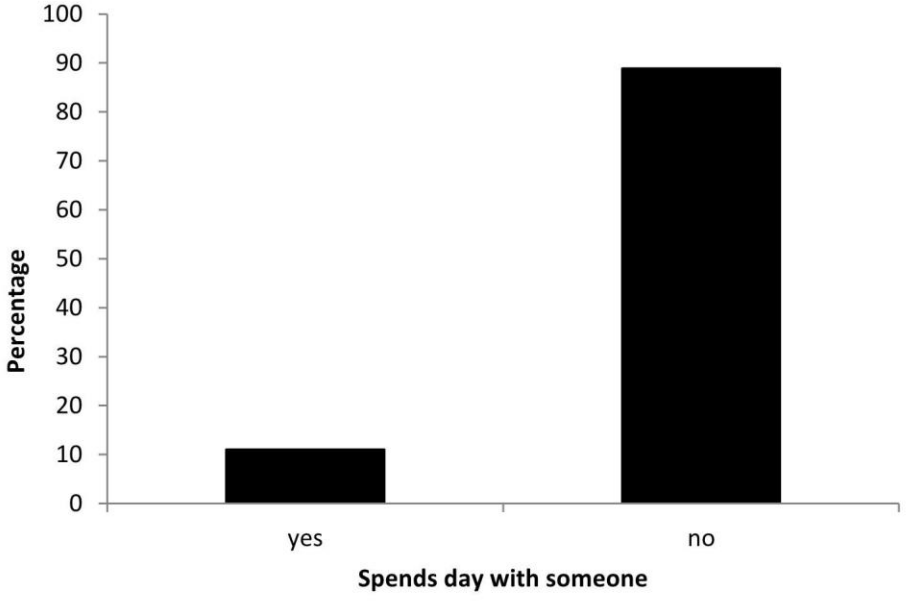


TABLE 16: Confide status in depressive elders (Question: Has someone to confide?)

S.No.	Has someone to confide in	Prevalence of Depression (n=208)	Percentage (%)
1	Yes	11	5.29
2	No	197	94.71

FIGURE 16: Confide status in depressive elders (Question: Has someone to confide?)

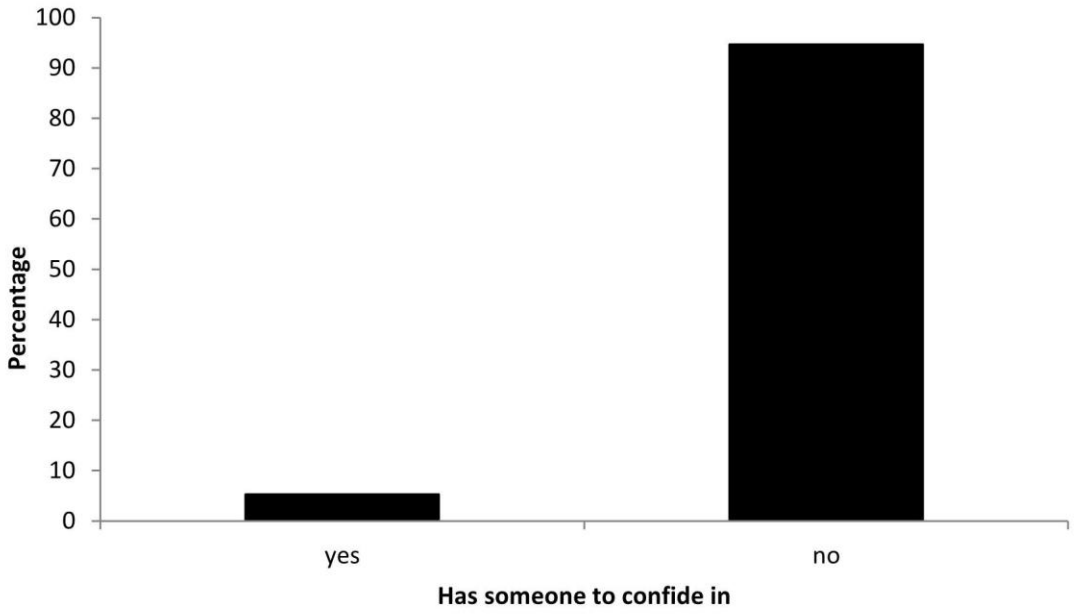


TABLE 17: Factors Associated with depression (Question: Makes new friends)

S.No.	Makes new friends	Prevalence of Depression (n=208)	Percentage (%)
1	Yes	6	2.88
2	No	202	97.12

FIGURE 17: Factors Associated with Depression (Question: Makes new friends)

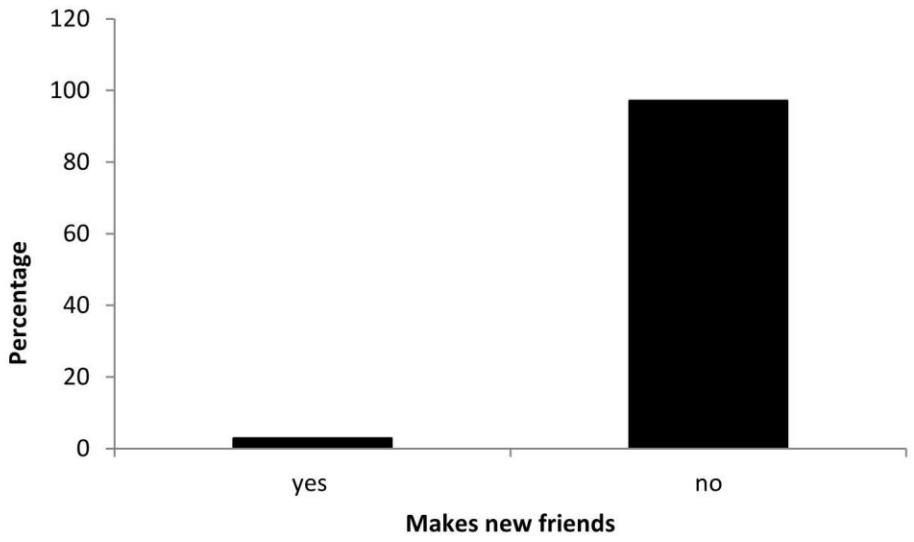


TABLE 18: Factors Associated with Depression (Question: Family illness in last 6 months)

S.No.	Family member ill in last 6 months	Prevalence of Depression (n=208)	Percentage (%)
1	Yes	89	42.79
2	No	119	57.21

FIGURE 18: Factors Associated with Depression (Question: Family illness in last 6 months)

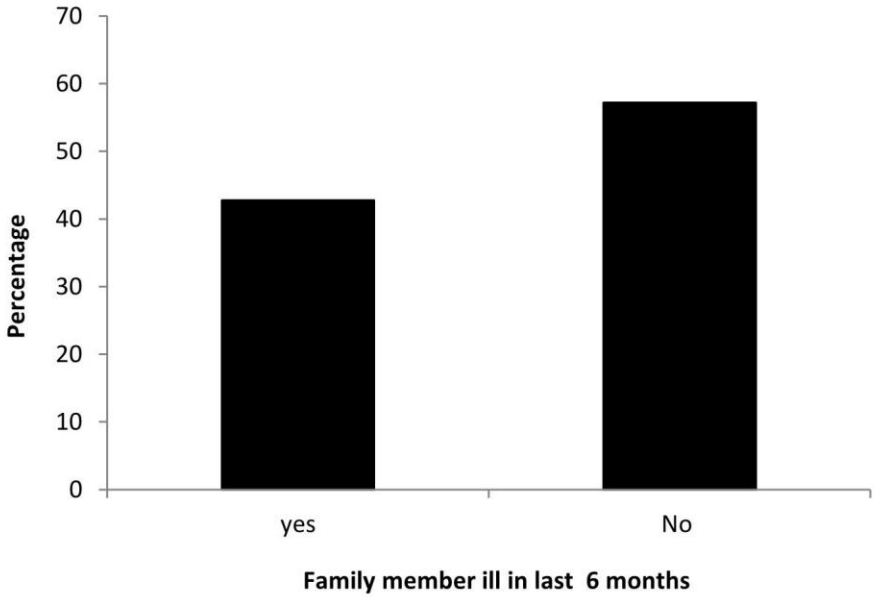


TABLE 19: Factors Associated with Depression (Question: Death of family member in last 6 months)

S.No.	Family member died in last 6 months	Prevalence of Depression (n=208)	Percentage (%)
1	Yes	121	58.17
2	No	87	41.83

FIGURE 19: Factors Associated with Depression (Question: Death of family member in last 6 months)

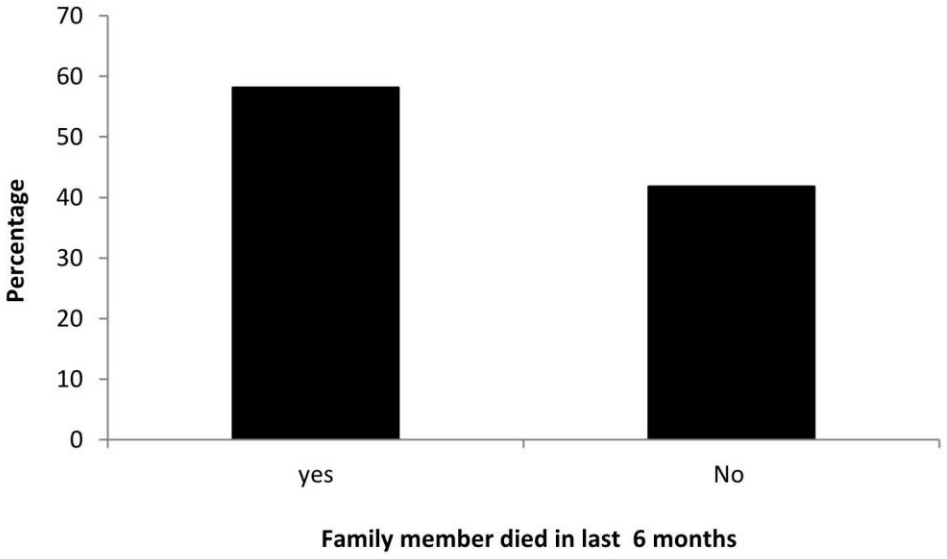


TABLE 20: Factors Associated with Depression (Question: Health and Disability)

S.No.	Number of medical condition	Prevalence of Depression (n=208)	Percentage (%)
1	0	8	3.85
2	1 or 2	94	45.19
3	3	32	15.38
4	4 or more	74	35.58

FIGURE 20: Factors Associated with Depression (Question: Health and Disability)

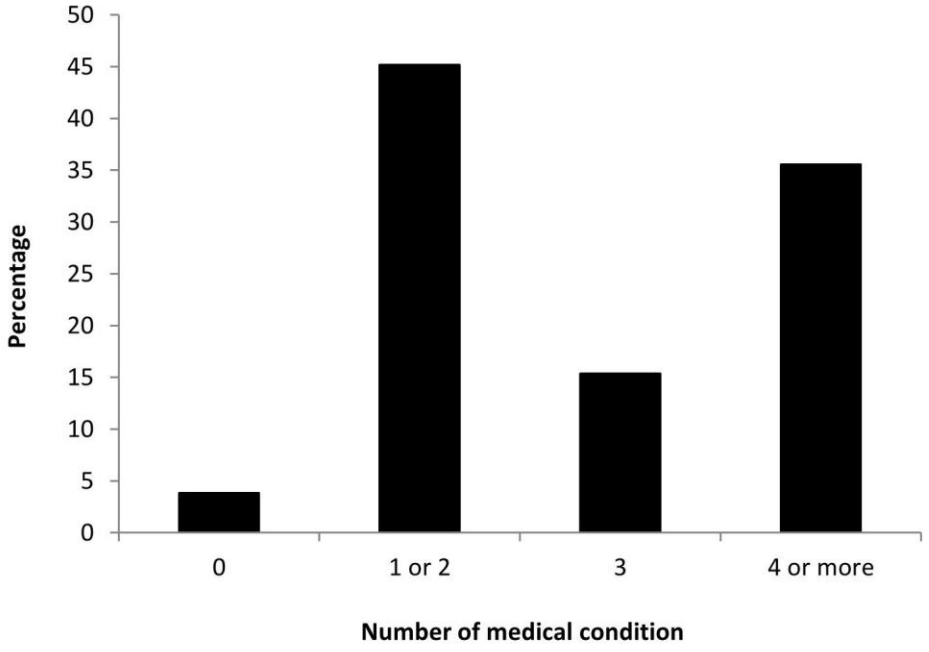


TABLE 21: Factors Associated with Depression (Question: Change in weight in past year)

S.No.	Change in weight in past year	Prevalence of Depression (n=208)	Percentage (%)
1	No change	138	66.35
2	Gained 10 Kg	13	6.25
3	Lost 10 kg	57	27.40

FIGURE 21: Factors Associated with Depression (Question: Change in weight in past year)

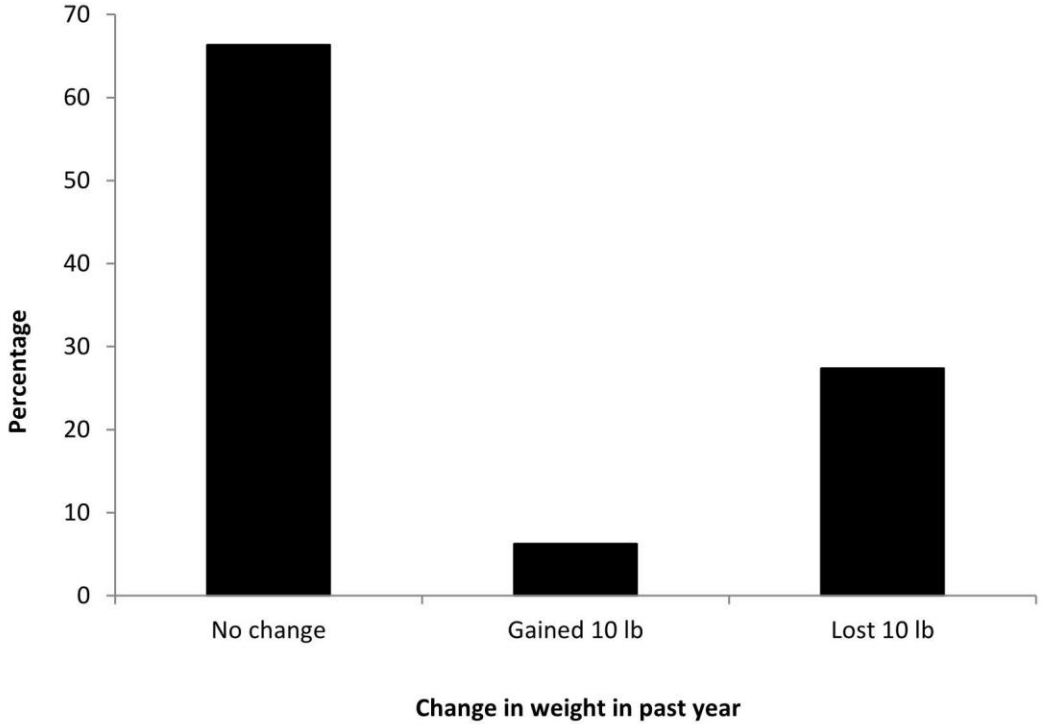


TABLE 22: Factors Associated with Depression (Question: Number of participants with Hypertension)

S.No.	Reported hypertension	Prevalence of Depression (n=208)	Percentage (%)
1	Yes	112	53.85
2	No	96	46.15

FIGURE 22: Factors Associated with Depression (Question: Number of participants with Hypertension)

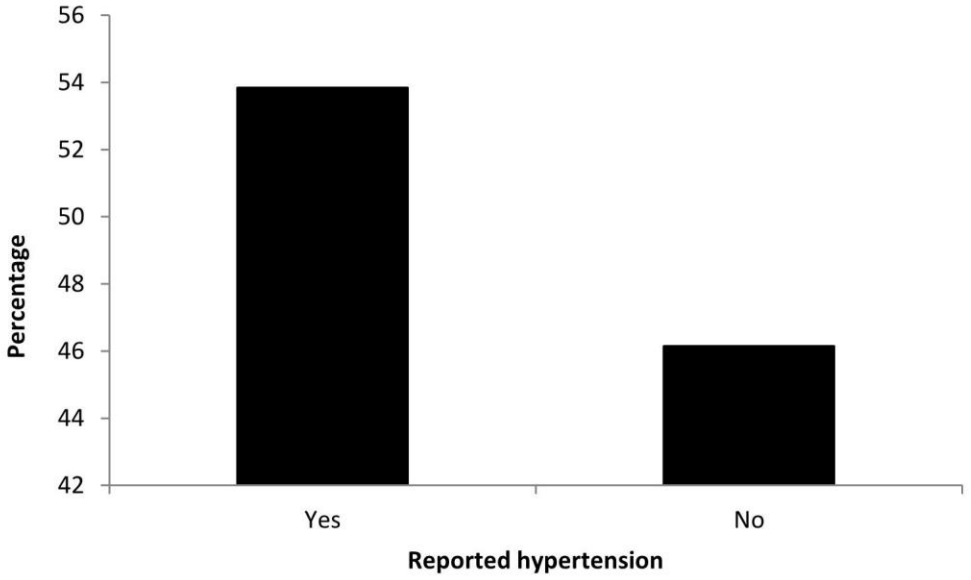


TABLE 23: Factors Associated with Depression (Question: Number of activities requiring assistance)

S.No.	Number of activities requiring assistance	Prevalence of Depression (n=208)	Percentage (%)
1	0	124	59.62
2	1	42	20.19
3	2	11	5.29
4	3 or more	31	14.90

FIGURE 23: Factors Associated with Depression (Question: Number of activities requiring assistance)

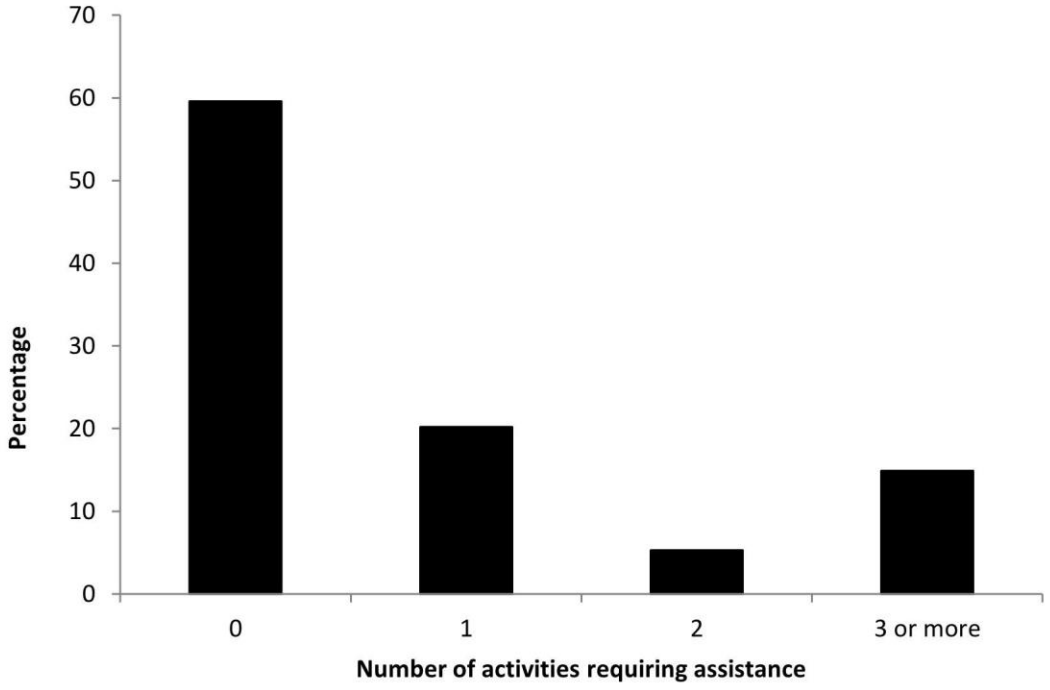


TABLE 24: Factors Associated with Depression (Question: Sleep pattern of the patients)

S.No.	Difficulty in falling asleep	Prevalence of Depression (n=208)	Percentage (%)
1	No	65	31.25
2	Yes	143	68.75

FIGURE 24: Factors Associated with Depression (Question: Sleep pattern of the patients)

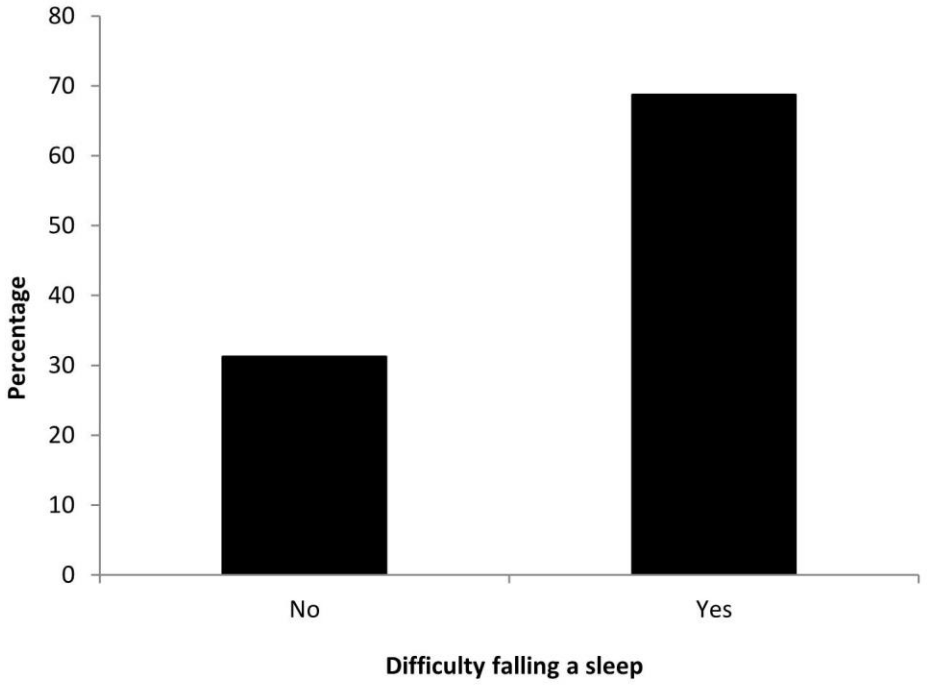


TABLE 25: Factors Associated with Depression (Question: Difficulty in walking up early)

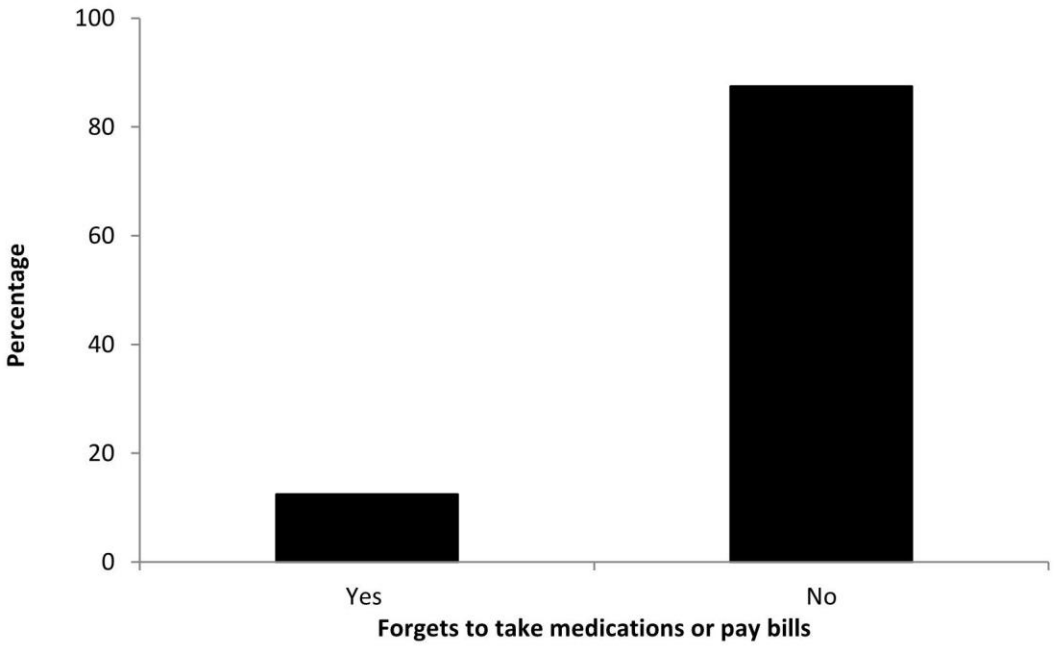
S.No.	walking too early	Prevalence of Depression (n=208)	Percentage (%)
1	No	94	45.19
2	Yes	114	54.81

FIGURE 25: Factors Associated with Depression (Question: Difficulty in walking up early)

TABLE 26: Factors Associated with Depression (Question: Forgets to take medications or pay bills)

S.No.	Forgets to take medications or pay bills	Depression present (n=208)	Percentage (%)
1	Yes	26	12.5
2	No	182	87.5

FIGURE 26: Factors Associated with Depression (Question: Forgets to take medications or pay bills)



6. DISCUSSION

Depression was the most common psychiatric problem in geriatric patients. This study examined the factors associated with depression among the elderly in a south Indian community (Kumarapalayam). 382 participants were selected for this study (Table 1). Among 382 participants, 208 (54.45%) elders reported to have depression according to GDS-15 score (Table 2). In 208 depressive elders, 79 (37.98 %)were in the age group of 60-70 years, 113(54.33%) were in the age group of 71-80 years and 16 (7.69%)were more than 81 years (Table 4). In a double stage sampling study conducted in Kerala regarding the geriatric depression and related risk factors it was found that the overall prevalence of depression was 25.4%. 60.1% of the population was suffering from various non-communicable diseases. 35% of the study population had no income or no property, 53.5% had no physical activity and 50% were spending day time without engaging in any work or other leisure time activity. Factors associated to the depression were illiteracy and lack of family support ($p<0.05$).[147]

Sati P[148] *et al,* conducted a study in Tamil Nadu on 103 geriatric patients among whom, 73 (70.9%) were aged 60–69 years and 58 (56.3%) were male. Forty-four (42.7%) individuals (17 males, 27 females) were found to be depressed; 23 (22.3%) with mild depression, 14 (13.6%) moderate depression and 7 (6.8%) severe depression. Female sex and widowhood were significantly associated with depression and the same was noted in the present study where the proportion of females was found to be higher 116 (55.7%) than that of males 92 (44.2%).

In our study the distribution of GSD scores was evaluated and it was found that severe depression symptoms was reported in 34(8.9%) of the participants while 66 (17.28%) reported moderate symptoms, 108 (28.2%) reported mild symptoms while majority of the

participants 174(45.5%) had no symptoms (Table 3). This result vary in a study conducted by Sreejith SN[149] *et al*, in which rural areas study revealed that 32.4% of individuals were suffering from depression. The median GDS score calculated was 5. Mean age was 68.07+/- 12.98. Depression in elderly is associated with poor socio economic status, unemployment, disrupted marital status, illiteracy, and substance abuse.

While studying the marital status of the depressive patients, 132(63.4%) were living with spouse, 61(29.3%) participants spouse had expired and the other causes reported to be 15 (7.21%) (Table 5).

Burden of depression was high among the illiterate people and those belonging to V class of socio economic status in a study conducted by Poonam RN *et al*,[150] on 230 geriatric patients. Similar results were seen in studies conducted in Kerala[151] and Maharashtra[152]. This could be because of understanding of the problems by the literate people and thereby seeking early health care. Also people belonging to low socio – economic status may approach the traditional healers for health care and this may result in poor outcome of the disorder. This results are complimenting to our study in which only a very few participants 55(26.44%) were educated while the larger strata remained illiterate 153 (73.5%).The depressed individuals in low-income communities rarely subscribe to biomedical causal models and hold more to psychosocial as well as interpersonal explanatory models for depression.[153]

Most of the depressive patients in our study come from joint family 141 (67.7%), only 67 (32.21%) comes from nuclear families. More than half of the participants were coming from a small family size 115 (55.29%), 93 (44.71%) patients had a larger family size. (Table 7, 8).

People belonging to low socio – economic status may approach the traditional healers for health care and this may result in poor outcome of the disorder.[134,135] In our study 131(62.9%) of the participants were having a low family income while 77(37.02%) had a family income of Rs 10000 and above (Table 9). The current study states that before 60 years, 163 (78.3%) were employed as housewives, clerical and technical staff teachers and others while 45(21.6%) were professionals (Table 10).

Another study by Prakash *et al*,[156] strengthens the notion that there is a direct relationship between unemployment and psychiatric problems. As noted by certainly the state of being unemployed is more likely to be associated with anxiety and depression than being employed and in the present study higher percentage of the participants are unemployed 142 (68.2%) and only 66 (31.7%) have job (Table 11).

In our study, 201 (96.6%) patients do not have a family history of any type of psychiatric illness and 7 (3.37%) only reported to have a family history (Table 12). It was found that among the depressive patients only a fewer 19 (9.13) had a history of past psychiatric illness and 189 (90.8%) do not have any past history in the current study (Table 13) while history of psychiatric illness has long been heralded as an important marker for psychiatric morbidity, in particular depression.[157]

History of substance abuse was studied in the depressive patients and the data showed that 14 (6.73%) were reported to have substance abuse while 194 (93.27%) do not have any history (Table 14). It was also found that only 23 (11.06%) depressive patients send their day with someone, 185 (88.9%) do not have any companion (Table 15) and the results states that a larger group of the patients 197 (94.7%) do not have anyone to confide in where 202 (97.12%) do not make any new friends, only a very few 6 (2.88%) makes new friends (Table 16 & 17).

In order to find out if Death was a cause of depression in the patients, the death of any family members of the depressive patients were enquired and 121 (58.17%) stated true while 87 (41.8%) do stated any death in their families (Table 19). When the disease condition was considered, 94 (45.19%) had a 1 0r 2 medical condition, only a minor 8 (3.8%) proportion was not affected with any diseases, 74 (35.55%) have more than 4 disease condition. (Table 20) and on comparing the weight of the patients 138 (66.3%) do not had any weight change while 13 (6.2%) had gained 10 Kg and 57 (27.4%) had lost 10 Kg of their weight (Table 21).

When the past medical history of the patient was considered, 112 (53.85%) of the patients were reported to have hypertension and while 96 (46.15%) do not had any (Table 22). The cause of the index visit was a physical disorder in 98% while a psychiatric disorder was observed in 2% of patients. The most common physical diagnosis as per the case records were hypertension, osteoarthritis, diabetes mellitus, constipation, bronchial asthma, and anemia. Subjects having physical diagnosis of predominantly hypertension suffered more from psychological distress (58.6%) as compared to the other physical diagnoses (42.4%).[156]

Among the depressive patients a majority of 124 (59.6%) do not required any assistance for doing various activities and 31 (14.90%) of the patients required assistance for doing more than 3 kind of activities (Table 23).

The sleep pattern of the patients were studied and showed that 143 (68.7%) had difficulty in falling asleep and only a minor proportion of patients 65 (31.25%) gets good sleep (Table 24) and when it comes to waking up early 114 (54.8%) patients used to wake up too early than their normal sleeping time and 94 (45.19%) do not wake up too early

(Table 25). All these parameters were assessed in the geriatric patients in order to evaluate the quality of life of the patients.

To ensure whether the patients were taking medications properly their medication interview was conducted and in the patients who were detected to have depression 26 (12.5%) forgets to take medication on time or to pay bills while the rest 182 (87.5%) do not have any such difficulties (Table 26).

Thus this study provides an insight that proper care and counseling need to be provided to geriatrics in order to improve their quality of life. However, the cross-sectional and observational nature of this study mandates the need for cohort designs to confirm associations and randomized trials to assess intervention.

7. CONCLUSION

The prevalence of symptoms of depression in the elderly population under study was significantly high (54.45%) in study area. This reflects the need for focusing on greater awareness of depression and to ensure availability and accessibility of appropriate health care support. These findings could guide to devise and implement effective and timely mental health interventions for older adults, in order to prevent geriatric depression and develop a comprehensive strategy for its early diagnosis. With increasing longevity and proportion of the elderly population in India, and the trend toward urbanization and nucleation of the families, depression among the elderly is likely to become a disease demanding "public health problem" status in the near future. Effective support and care of the old age population can promise more fruitful life for our old citizens.

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JKKN
College of Pharmacy

J.K.K.NATTRAJA ETHICS COMMITTEE

J.K.K.NATTRAJA COLLEGE OF PHARMACY

(MANAGED BY J.K.K.RANGAMMAL CHARITABLE TRUST)
Natarajapuram, NH-544 (Salem to Coimbatore),
Komarapalayam -638 183, Namakkal District, Tamil Nadu.

Ref: JKKNCP/ETHICS_PRACTICE/018PDS02 ***Date: 17.07.2017***

To
Dr. N. Venkateswaramurthy, M.Pharm, PhD.,
Department of pharmacy practice,
J.K.K. Nattraja College of Pharmacy,
Kumarapalayam – 638183,
India.

Dear Venkateswaramurthy,

The proposal entitled **"PREVALENCE OF DEPRESSION AND ASSOCIATED RISK FACTORS AMONG THE ELDERLY"** was reviewed by the ethics committee in its meeting held on 17.*07.2017* and permission is granted to you to carry out the study.

Thanking you,

Yours faithfully,

Dr. A. Sivakumar
Chairman of Ethics Committee

PRINCIPAL
J.K.K.NATARAJA DENTAL
COLLEGE & HOSPITAL
KOMARAPALAYAM - 638183

INFORMATION FOR PATIENT

Dear participant,

I **Mr.MUHAMMED SHAHEER .K, [REG.No.261640205]** student of **J.K.K.Nattraja College of Pharmacy, Kumarapalayam** currently conducting a project entitled **"Prevalence Of Depression And Associated Risk Factors Among The Elderly"** for the partial fulfillment for the award of Degree of **Master of Pharmacy** in **Pharmacy Practice.**

As the part of project we need to collect data regarding my studies from you.

We will appreciate very much if you could kindly assist us to collect your medical data's. However identifiable personal data's will not be disclosed.

Thank you very much for your kind participation.

CONSENT FORM

I, _____, have read and understand the above information. I have agreed to allow my data to be collected for the project work.

_____ _____

Signature of participant Date

_____

Signature of translator

ANNEXURE - (1)

1. Name of the Patient:
2. Address:
3. Gender :
   a. male b. female
4. Participant's Age
   a. 60-70 b. 71-80 c. More than 81

5. Geriatric depression scale (GDS)

DATE:

1	Are you basically satisfied with your life?	**No** Yes
2	Have you dropped many of your activities or interests?	**Yes** No
3	Do you feel that your life is empty?	**Yes** No
4	Do you often feel bored?	**Yes** No
5	Are you in good spirits most of the time?	**No** Yes
6	Are you afraid that something bad is going to happen to you?	**Yes** No
7	Do you feel happy most of the time?	**No** Yes
8	Do you often feel helpless?	**Yes** No
9	Do you prefer to stay at home, rather than going out and doing new things?	**Yes** No
10	Do you feel you have more problems with your memory than most?	**Yes** No
11	Do you think it is wonderful to be alive?	**No** Yes
12	Do you feel pretty worthless the way you are now	**Yes** No
13	Do you feel full of energy?	**No** Yes
14	Do you feel that your situation is hopeless?	**Yes** No
15	Do you think that most people are better off than you are?	**Yes** No
> 5 problems (answers in BOLD) indicates probable depression **TOTAL:**		

6. GERIATRIC DEPRESSION SCALE (GDS) - SCORE

1. The GDS short form (15 questions) has been derived from the 30 question version. It has been designed for the assessment of depressive symptomatology in elderly people and excludes any questions relating to the physical symptoms of depression common in old age.

2. The GDS is a screening device and should not be used as a diagnostic tool. It can be used to monitor the client's emotional state in relation to treatment or change in physical health. The questionnaire can guide further clinical interviews and when used this way has been found very acceptable to clients.

3. **The questions are read out** and the patient is asked how they have felt over the past week using a Yes/No response format. No further explanation or interpretation should be given to the questions.

4. Each answer indicating depression (bold 'yes' or 'no) counts one point. Scores greater than 5 are indicative of probable depression.

ANNEXURE - (2)

DEPRESSION PREVALENCE

1. Marital status:
    a. Living with spouse
    b. Either spouse expired
    c. Other
7. Educational status:
    a. Literate b. Illiterate
8. Family type:
    a. Joint b. Nuclear
9. Family size:
    a. Small ≤ 5 b. Large ≥ 5
10. Family Income:
    a. ≤ 10,000 b. > 10,000
11. Past occupational status of the depressive elder's (before 60 years):
    a. Professional / administrative class
    b. Others (includes Housewives, clerical & technical staff, teachers & others)
12. Present occupational status of the depressive elder's:
    a. Employed
    b. Unemployed
13. Family history of psychiatric illness:
    a. Present
    b. Absent
14. Past history of psychiatric illness:
    a. Present
    b. Absent
15. Lifetime history of substance abuse:
    a. Present
    b. Absent
16. Opportunities for companionship (spends day with someone)
    a. Yes
    b. No

17. Has someone to confide?
    a. Yes
    b. No
18. Makes new friends?
    a. Yes
    b. No
19. Family illness in last 6 months?
    a. Yes
    b. No
20. Death of family member in last 6 months?
    a. Yes
    b. No
21. Number of medical condition?
    a. 0
    b. 1 or 2
    c. 3
    d. 4 or more
22. Change in weight in past year
    a. No change
    b. Gained 10 kg
    c. Lost 10 kg
23. Participants reported with Hypertension
    a. Yes
    b. No
24. Number of activities requiring assistance?
    a. 0
    b. 1
    c. 2
    d. 3 or more
25. Sleep pattern of the patients?
    a. Yes
    b. No
26. Difficulty in walking up early?

a. Yes

b. No

27. Forgets to take medications or pay bills

a. Yes

b. No